PROCEEDINGS OF THE SEVENTEENTH ANNUAL MEETING OF THE BERKELEY LINGUISTICS SOCIETY

February 15-18, 1991

GENERAL SESSION
and
PARASESSION
ON
THE GRAMMAR
OF
EVENT STRUCTURE

Berkeley Linguistics Society
Berkeley, California, USA
PROCEEDINGS OF THE SEVENTEENTH ANNUAL MEETING
OF THE
BERKELEY LINGUISTICS SOCIETY
February 15-18, 1991

GENERAL SESSION
and
PARASESSION
ON
THE GRAMMAR
OF
EVENT STRUCTURE

edited by
Laurel A. Sutton
Christopher Johnson
with
Ruth Shields

Berkeley Linguistics Society
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>v</td>
</tr>
<tr>
<td>Table of Contents of BLS 17S</td>
<td>ix</td>
</tr>
<tr>
<td>Preface</td>
<td>xi</td>
</tr>
<tr>
<td><strong>GENERAL SESSION</strong></td>
<td></td>
</tr>
<tr>
<td>The notions of topic and subject in Malay</td>
<td>3</td>
</tr>
<tr>
<td>LUBNA ALSAGOFF</td>
<td></td>
</tr>
<tr>
<td>Object extraction and the accessibility of thematic information</td>
<td>15</td>
</tr>
<tr>
<td>ALEX ALSINA and SAM MCHOMBO</td>
<td></td>
</tr>
<tr>
<td>The agreement hierarchy and grammatical theory</td>
<td>30</td>
</tr>
<tr>
<td>MICHAEL BARLOW</td>
<td></td>
</tr>
<tr>
<td>The pace of syntactic acquisition</td>
<td>41</td>
</tr>
<tr>
<td>DEREK BICKERTON</td>
<td></td>
</tr>
<tr>
<td>Locative case vs. locative gender</td>
<td>53</td>
</tr>
<tr>
<td>JOAN BRESNAN</td>
<td></td>
</tr>
<tr>
<td>Voicing is not relevant for sonority</td>
<td>69</td>
</tr>
<tr>
<td>YOUNG-MEE YU CHO</td>
<td></td>
</tr>
<tr>
<td>The effects of discourse on Indonesian relative clauses</td>
<td>81</td>
</tr>
<tr>
<td>MICHAEL EWING</td>
<td></td>
</tr>
<tr>
<td>A study of Chinese loanwords in Dongxiang Mongolian</td>
<td>92</td>
</tr>
<tr>
<td>KENNETH L. FIELD</td>
<td></td>
</tr>
<tr>
<td>The moraic status of initial geminates in Trukese</td>
<td>107</td>
</tr>
<tr>
<td>MICHELE E. HART</td>
<td></td>
</tr>
<tr>
<td>The effect of F0 fall rate on accent perception in English</td>
<td>121</td>
</tr>
<tr>
<td>KAZUE HATA and YOKO HASEGAWA</td>
<td></td>
</tr>
<tr>
<td>The passive construction and case in Korean</td>
<td>130</td>
</tr>
<tr>
<td>KI-SUN HONG</td>
<td></td>
</tr>
<tr>
<td>The role of the Korean topic marker in foregrounding speaker stance</td>
<td>144</td>
</tr>
<tr>
<td>KYU-HYUN KIM</td>
<td></td>
</tr>
<tr>
<td>Integrating semantic &amp; syntactic accounts of unaccusativity:</td>
<td>156</td>
</tr>
<tr>
<td>A connectionist approach</td>
<td></td>
</tr>
<tr>
<td>GÉRALDINE LEGENDRE, YOSHIRO MIYATA, and PAUL SMOLENSKY</td>
<td></td>
</tr>
<tr>
<td>Syllabic consonants in Chinese: Representation and syllabification</td>
<td>168</td>
</tr>
<tr>
<td>YEN-HWEI LIN</td>
<td></td>
</tr>
</tbody>
</table>
On the validity of the restructuring account of purposive and similar complex predicates in Japanese
YO MATSUMOTO

Synchronic rule inversion
JOHN McCARTHY

(ae) in San Francisco English
BIRCH MOONWOMON

Nominal 'tautologies' in Japanese: X wa X, X ga X, and X mo X
SHIGEKO OKAMOTO

Regular and irregular morphology and the psychological status of rules of grammar
STEPHEN PINKER and ALAN PRINCE

Condition duplication, paradigm homonymy, and transconstuctural constraints
GEOFFREY PULLUM and ARNOLD ZWICKY

The development of nominal/non-nominal class marking by tone in Shimen Hmong
MARTHA RATLIFF

Event-packing: The case of object-incorporation in English
SALLY A. RICE and GARY D. PRIDEAUX

Mixers, mufflers, and mousers: The extending of the -er suffix as a case of prototype reanalysis
MARY ELLEN RYDER

Subject and object honorificiation in Japanese
PETER SELLS and MASAYO IIDA

The semantics of Guarani agreement markers
MAURA VELÁZQUEZ-CASTILLO

PARASESSION

Event construal and case role assignment
SCOTT DELANEY

Point of view and prospective agent
MICHELE EMANATIN

You can’t be in two places at once: Paths and the resultative
ADELE GOLDBERG
The conceptual structure of intentional action: data from Kathmandu Newari
DAVID HARGREAVES

A cognitive grammar approach to perfect aspect:
Evidence from Chinese
YUCHAU E. HSIAO

Dispersed verbal predicates in vernacular written narratives
PAUL HOPPER

Prelinguistic Primitives
JEAN MANDLER

Temporal priority and pragmatic ambiguity:
The case of already
LAURA MICHAELIS

Adverbial quantification and event structures
BARBARA PARTEE

The ecology of a semantic space
ERIC PEDERSON

The perfective paradox or how to eat your cake and have it too
MONA SINGH

Path to realization - Via aspect and result
LEN TALMY

Shifting of reference-time and perspective
ALICE G.B. TER MEULEN

The following papers were presented at the conference but do not appear in this volume:

Wackernagel's Law cliticization from unaccusative and unergative subject positions in Anatolian
ANDREW GARRETT

Quantity-sensitivity and the nature of templatic parsing
PAUL KIPARSKY

The metaphorical understanding of event structure
GEORGE LAKOFF

Morphological variability in verb serialization and event structure
MARSHALL LEWIS
# Table of Contents for Special Session
To be found in BLS 17S

**Special Session**

- Floating morphemes in Ndo
  *Pierre Bancel*  
  Page 3

- The two-directional tone melody spread in Sukuma  
  *Herman M. Batibo*  
  Page 15

- Vowel height assimilation in Bantu languages  
  *George N. Clements*  
  Page 25

- Command and Fula d'um pronominals  
  *Christopher Culy*  
  Page 65

- Jita glide epenthesis and the Maximality Principle  
  *Laura J. Downing*  
  Page 74

- Locatives vs. instrumentals in Kinyarwanda  
  *Donna Gerdts and Lindsay Whaley*  
  Page 87

- Object asymmetries in Kitharaka  
  *Carolyn Harford*  
  Page 98

- Auxiliaries in African languages: the Lingala case  
  *Bernd Heine*  
  Page 106

- Tone metathesis in the Dangme imperative  
  *Dan Holscher, Monica Macaulay, and Marnie Jo Petray*  
  Page 120

- Cyclicity and suffix doubling in the Bantu verb stem  
  *Larry M. Hyman and Francis X. Katamba*  
  Page 134

- Articulatory phonology and Sukuma "aspirated nasals"  
  *Ian Maddieson*  
  Page 145

- Facts count: An empiricist looks at indirect objects in Hausa  
  *Paul Newman*  
  Page 155

- Feature-changing harmony in Turkana  
  *Manuela Noske*  
  Page 166

- Language contact, creolization and genetic linguistics: the case of Mwiini  
  *Derek Nurse*  
  Page 177

- The intersection of syntax, semantics, and phonology in Kikongo  
  *David Odden*  
  Page 188
What is a symmetrical language? Multiple object constructions in Bantu
JOSEPHAT M. RUGEMALIRA

High tone shift in KiNyamwezi
THILO C. SCHADEBERG

Category asymmetries in Hausa asymmetric coordination
LINDA SCHWARTZ

Two subject positions in Lango
ELLEN WOOLFORD

The following papers were presented at the conference but do not appear in this volume:

Glide alternations in Yoruba
AKIN AKINLABI

Root and foot in Kikuyu reduplication
LONG PENG
We present to you the proceedings of the Seventeenth Annual Meeting. The February conference featured a Parasession on the Grammar of Event Structure and the second Special Session. This year’s topic was African Language Structures and those papers appear in our companion volume, BLS 17S. This year we also published an Author Index for BLS 1-16S.

As always, we are grateful to those who helped in pulling off the conference, among them Beth Daniels, Jeong-Woon Park, Martha Mendoza, Anita Liang, Kira Hall, Michael Meacham, Sondra Reinman, Kevin Moore, and Sarah Taub. We wish to thank Kathleen Hubbard especially for all her work on the Special Session.

We hope you really love BLS 17.

1990-91 BLS Officers
Laurel A. Sutton
Christopher Johnson
Ruth Shields
GENERAL SESSION
The Notions of Subject and Topic in Malay

Lubna Alsagoff
Stanford University

0. Introduction

It is an uncontroversially accepted fact that the notion of subject is central to syntactic theory. This contrasts with the status of topic in syntactic theory: a notion whose importance to syntactic theory has not been acknowledged to the same extent in the literature, and has often been marginalized as a discourse function with little integration into the overall syntactic organization of language. The primary aim of this paper is to demonstrate the inadequacy of this approach by arguing for the importance of topic to Malay syntax. In particular, certain syntactic characteristics or behavior, previously exclusively associated with subjects, are shown, in Malay, to be shared with topics.

Strong evidence of this comes from a consideration of obligatory control facts in Malay, which evinces the necessity of including the notion of topic in the definition of the control site of equi constructions. Whereas most syntactic frameworks differ in the ways in which the controller of control constructions such as equi have been characterized, they have commonly assumed it as a fact of Universal Grammar that the controller of such constructions is the grammatical subject. The data on Malay, however, conclusively argues that such an assumption needs to be reconsidered to include topic as a necessary condition on the the identity of the control site. In addition, evidence from relativization further corroborates this thesis that properties thought to be uniquely characteristic of grammatical subjects are in fact shared by topics.

1. An Outline of the Problem

The basic facts on the three constructions that this paper will be focussing on, meng-, di- and $\emptyset$-, are outlined in this section. In particular, the central problem that is raised by the data on the $\emptyset$- construction is discussed. A consideration of the facts from the perspective of obligatory control constructions provides evidence that while a straightforward analysis of the di- construction as passive suffices to provide an account of the facts, neither the traditional analysis in which the $\emptyset$-construction is treated as an object-fronted construction, nor the analysis proposed by Chung (1976a, b) in which it is analyzed as passive, is adequate in providing an explanation of the full range of data: in particular, the dialectal split in the way the $\emptyset$-construction behaves in control structures.

1.1. The Di- Construction

Malay is a configurational language with a basic subject-verb-object constituent order, i.e. the basic pattern of an active sentence in Malay will have the subject in the initial position, and the object in the post-verbal position, as in the meng- construction in sentence (1), in contrast to the di- construction in (2a) which is passive:

1. Mariam memukul doktor itu.
   Mariam MENG-beat doctor the
   Mariam beat/is beating the doctor.
2a. Doktor itu dipukul (oleh Mariam).
    doctor the DI-beat (by Mariam)
The doctor is/was beaten (by Mariam).
b. *Doktor itu dimemukul/mendipukul oleh Mariam.
    doctor the DI-MENG-beat/MENG-DI-beat by Mariam

In the *meng-* construction in (1), the agent, Mariam, is the subject, while the postverbal patient *doktor itu* is the object. In contrast, in the *di-* sentence (2a), the patient *doktor itu*, instead of the agent, is now the grammatical subject, while the agent is a chomeur. And as with passives in English, the logical subject is optional, as indicated by the parentheses in (2a) above.\(^3\) Since a sentence can, of course, only be marked for voice once, it is not surprising therefore that *di-* , the passive voice marker, is restricted from co-occurring with *meng-* , as demonstrated in (2b).

Passivization can, in very broad terms, be characterized as an operation that alters a default association between the grammatical functions and the thematic roles. Hence for languages typologically termed *accusative* languages, such as English, French, and Malay, in unmarked active sentences, the subject is normally linked to the *logical subject*, with the object thus linking to the next highest thematic role, i.e., what we will refer to in this paper as the *logical object*. In passive sentences, this linking pattern is altered in that the logical subject is no longer eligible for linking with the subject -- as a result of a change in the verbal morphology -- allowing the logical object, the theme in the case of sentence (2a), to link with the grammatical subject.\(^4\) Therefore, instead of the agent Mariam in (1), the theme, doktor itu, is now the subject in both these sentences.

Obligatory control basically provides a test for identifying the subject in a clause. In such structures ((3), (4)), there is a missing argument in the lower clause, i.e. an argument that cannot be lexically realized ((3b)), the obligatory controller, whose reference is determinable by association with an argument in the higher clause, called the controller. This missing argument or controller is uniquely and universally characterized as the grammatical subject.\(^5\) The generalization that emerges from the data in sentences (3) and (4) below is that the verbal prefix *di-* has the effect of changing the identity of the obligatory controller, and hence the subject, from the agent to the patient:

3a. Ali menyuruh Mariam [ _ memukul doktor itu].
    Ali MENG-asv Mariam [ _ MENG-beat doctor the]
    Ali asked Mariam to beat the doctor.
b. *Ali menyuruh Mariam [Samad memukul doktor itu].
    Ali MENG-asv Mariam [Samad MENG-beat doctor the]
c. *Ali menyuruh Mariam [Samad memukul _].
    Ali MENG-asv Mariam [Samad MENG-beat _]

4a. Ali menyuruh doktor itu [ _ dipukul oleh Mariam].
    Ali MENG-asv doctor the [ _ DI-beat by Mariam]
    Ali asked the doctor to be beaten by Mariam.
b. *Ali menyuruh Mariam [doktor itu dipukul _].
    Ali MENG-asv Mariam [doctor the DI-beat _]
In (3a), the lower clause of the sentence is the active *meng*-construction. Here, the subject is the agent, and is the controller. In (4a), where the lower clause is the *di*-construction, there is a change in the identity of the controller: the theme, *doktor itu*, is now interpreted to be the subject of the lower clause, since this is now the only eligible controller. This is evidence that the *di*-construction is indeed a passive construction. (3b) corroborates the results of the control test by demonstrating that the gap or control site must be obligatorily present. In addition, examples (3c) and (4b) give evidence that it has to be the subject that functions as the controller: neither objects nor obliques are eligible as sites for control.

1.2. The *Ø*-Construction

In the set of examples below, sentence (6) is the corresponding *Ø*-construction for the sentence in (5a). Just as there is a prefix in the *di*-construction, similarly, it is possible to analyze the *Ø*-construction as involving a null prefix which may not co-occur with the active *meng*-prefix. In (6), the nominal phrase *doktor itu*, which is the theme, gets promoted to the initial position of the sentence, before the logical subject or agent *saya*. However, since object preposing is an operation that does not alter the linking patterns of the argument structure, the first person pronoun remains as the grammatical subject, and the phrase *doktor itu* is still the object. Only their linear positions have changed:

5a. *Saya memeriksa doktor itu.*
   1SPR MENG-examine doctor the
   I examined the doctor.
5b. *Saya *Ø*-periksa doktor itu.*
   1SPR Ø-examine doctor the
   b. *Saya *Ø*-periksa doktor itu.*
   1SPR Ø-examine doctor the
   c. *Doktor itu saya memeriksa.*
   doctor the 1SPR MENG-examine
   The doctor, I examined.
6. *Doktor itu saya *Ø*-periksa.*
   doctor the 1SPR Ø-examine
   The doctor, I examined.

In *Ø*-constructions, instead of the logical subject, the logical object now occupies the initial position in the sentence. This change in the word order is obligatorily triggered by the *Ø*-prefix: (5b) shows that a subject-verb-object word order is unacceptable when the verb is inflected with the *Ø*-prefix, and conversely ((5c)), when it is inflected with *meng-*, the object cannot be preposed as the initial constituent of the sentence. (5c) also makes the point that the verb in a *Ø*-construction cannot be inflected with *meng-*, and must occur in its stem form.

In the traditional literature, the *Ø*-construction is characterized simply as a non-passive, object-preposed construction, where all that is altered is the word order of the constituents. Chung (1976a, b), on the other hand, analyses the *Ø*-construction as being yet another passive construction (in addition to the *di*-construction), and thus treats the preposed logical object as the newly promoted grammatical subject of the passive. In defense of this analysis, Chung presents data on adverbial complements of purpose equi constructions as a test of the grammatical subjecthood of the logical object. The following data on transitive complement equi constructions corroborate Chung’s analysis of the *Ø*-construction as passive:
When the lower clause is a $\emptyset$-construction as in (8), the only argument that can be controlled is the initial argument, thereby suggesting that this argument is the new grammatical subject. This clearly supports Chung’s argument for an analysis of the $\emptyset$-construction as a true passive construction, in which the logical object in the unmarked active construction has been promoted to the grammatical subject. The data thus refutes the traditional approach in which the $\emptyset$-construction is considered as non-passive, where the initial argument is simply a preposed object, since this treatment of the facts predicts that this argument should not be controllable.

Given the data in (7) and (8), it therefore appears that Chung’s analysis is sufficient for an adequate explanation of the facts pertaining to control. However, this is not quite the case, since the data in (7) and (8) do not represent the entire corpus. In an informal survey of approximately 20 speakers of Indonesian and Malay, there is a marked and consistent dialectal split, with about half the speakers giving judgements of data as above, and the other half indicating yet another pattern for the control constructions, as given in (9):

$9a. \text{ *Ali menyuruh doktor itu [ _ saya } \emptyset\text{-periksa}.}$
   Ali MENG-as $\text{ k } 1\text{SPR [ _ MENG-examine doctor the]}$
     (DIALECT B)

$9b. \text{ *Ali menyuruh saya [ doktor itu } \emptyset\text{-periksa]}$
   Ali MENG-as $\text{ k } 1\text{SPR [doctor the } \emptyset\text{-examine]}$

The newly introduced data in (9) definitely illustrate that in this dialect, the $\emptyset$-construction is not analyzable as passive, since under this analysis, while the ungrammaticality of (9b) can be explained by the fact that the gap is not the subject, the unacceptability of (9a) becomes a problem because the analysis predicts that as the grammatical subject, the initial argument should be controllable. The problem is further complicated because treating the $\emptyset$-construction as non-passive also does not work. In this case, while the ungrammaticality of (9a) is easily explained by stating that the gap in these cases is not the grammatical subject in the lower clause, (9b) remains unexplained: here, although the gap is the subject, control is still not possible.

In fact, that neither of the arguments in the lower $\emptyset$-construction clause is eligible for control presents an even larger problem. If we accept the assumption that Universal Grammar designates the controller of equi constructions must be the subject, then we come to an impasse with the facts in (9), since they allude that there is no grammatical subject in $\emptyset$-sentences, something which contemporary syntactic theory strictly prohibits (e.g. Chomsky (1986), Bresnan and Kanerva (1988)). Thus we need still to explain why if there is a grammatical subject in the
embedded clauses, it cannot be controlled.

2. Introducing the Notion of Topic

The facts above point to the need for a new analysis of the $\emptyset$- constructions that can explain the facts on control. In addition, they also raise the issue of whether, in the construction of such an analysis, this dictates changing previous assumptions about the identity of the controller in equi constructions. This paper demonstrates that the key to the problems raised by the control facts lies in the introduction of the topic function. Section 2.1 provides evidence from the -kah construction that there is in fact a topic position at the clause level, which in Malay is the initial argument position. Section 2.2, which deals with relativization, demonstrates that the topic function exhibits a number of properties that are usually assumed in the literature to be the exclusive properties of grammatical subjects.

2.1. -Kah Construction

One uncontroversially accepted characteristic of topics is that they cannot be questioned. In particular, questioning in place of topics is not possible. This follows from the idea, shared in almost all discussions of topics, e.g. Chafe (1976), Givon (1979), Ward (1986), that topic is that which is the given, or common knowledge in the discourse structure, or in some other terminology, the presuppositional stratum on which new information is introduced. It is therefore something that cannot be elicited in a question by virtue of it being by definition, the shared information on which the discourse is framed. In this subsection, one type of construction will be considered: questioning in situ with the suffix -kah.

-Kah is a suffix that functions as a marker of the interrogative and focus. The constructions involving -kah basically are yes-no interrogatives that question a sentence or proposition containing a focussed constituent, i.e. the one to which -kah is attached. Therefore since topic occupies the initial position of the clause, it stands to reason that this first constituent cannot take the suffix -kah, since, as mentioned earlier, topics cannot be questioned, and that a constituent cannot be both topic and focus simultaneously at the same level of clause structure (Bresnan and Mchombo 1987).

10a. *Mariamkah memukul doktor itu tadi?
  Mariam-KAH MENG-beat doctor the just now
b. Mariam memukul doktor itu kah tadi?
  Mariam MENG-beat doctor the-KAH just now
  Was it the doctor Mariam beat just now?
c. Mariam memukul doktor itu tadi kah?
  Mariam MENG-beat doctor the just now-KAH
  Was it just now that Mariam beat the doctor?
11a. *Doktor itu kah dipukul oleh Mariam tadi?
  doctor the-KAH DI-beat by Mariam just now
b. Doktor itu dipukul oleh Mariam kah tadi?
  doctor the DI-beat by Mariam-KAH just now
  Was it Mariam that the doctor was beaten by just now?
c. Doktor itu dipukul oleh Mariam kah?
  doctor the DI-beat by Mariam just now-KAH
  Was it just now that the doctor was beaten by Mariam?
12a. *Doktor itukah awak periksa tadi?
doctor the-KAH 2SPR examine just now
Was it the doctor that you examined just now?
b. Doktor itu awak-kah periksa tadi?
   doctor the 2SPR-KAH examine just now
   Was it you who examined the doctor just now?
c. Doktor itu awak periksa tadiakah?
   doctor the 2SPR examine just now-KAH
   Was it just now that you examined the doctor?

In all three types of construction, the initial argument cannot be questioned. Although it may be possible to explain the data by saying that it is the subject in the sentence that cannot be questioned, if the Ø-sentences are analyzed as passives (setting aside the problems faced in the equi constructions), it is an unsatisfactory analysis because whereas topics are by definition understood to be constituents that cannot be questioned, such a property is not associated with grammatical subjects. Therefore it is clear that it is necessary to characterize the constituent, the initial argument, that cannot be questioned in all three constructions as the topic.

2.2. Relativization

The relative clause constructions in (13) to (14) demonstrate clearly that in both the meng- and di- constructions, only the subject can be relativized: objects and oblique are not possible gaps. In Keenan and Comrie's (1977) Noun Phrase Accessibility Hierarchy, subjects have the property of being the most accessible position to extract from. In Malay, we see that such a hierarchy is not sufficient to account for the facts on the Ø- construction ((15)). Just as there was a dialectal split in the control facts, relative clause constructions also exhibit a difference in speaker judgements. (15b) is ungrammatical for speakers of dialect B, but grammatical for speakers of dialect A.

13a. Budak itu memasak ikan untuk kuching saya.
   Boy the MENG-cook fish for cat 1SPR
   The boy cooked the fish for my cat.
   b. Budak itu yang ___ memasak ikan untuk kuching saya
      boy the COMP ___ MENG-cook fish for cat 1SPR
      The boy who cooked the fish for my cat
   c. *Ikan yang budak itu memasak ___ untuk kuching saya
      fish COMP boy the MENG-cook ___ for cat 1SPR
      The fish that was cooked by the boy for my cat
   d. *Kuching saya yang budak itu memasak ikan untuk ___
      cat 1SPR COMP boy the MENG-cook fish for ___

14a. Ikan dimasak oleh budak itu untuk kuching saya.
    fish DI-cook by boy the for cat 1SPR
    The fish was cooked by the boy for my cat.
   b. Ikan yang ___ dimasak oleh budak itu untuk kuching saya
      fish COMP ___ DI-cook by boy the for cat 1SPR
      The fish which was cooked by the boy for my cat
   c. *Budak itu yang ikan dimasak (oleh) ___ untuk kuching saya
      boy the COMP fish DI-cook (by) ___ for cat 1SPR
      The fish which was cooked by the boy for my cat
   d. *Kuching saya yang ikan dimasak oleh budak itu untuk ___
      cat 1SPR COMP fish DI-cook by boy the for ___

15a. Ikan awak Ø-masak untuk kuching saya.
    fish 2SPR Ø-cook for cat 1SPR
The fish you cooked for my cat
b. (A/B*) Ikan yang ___ awak Ø-masak untuk kuching saya
   fish COMP ___ 2SPR Ø-cook for cat 1SPR
   The fish which you cooked for my cat
c. *Awak yang ikan ___ Ø-masak untuk kuching saya
   2SPR COMP fish ___ Ø-cook for cat 1SPR
d. *Kuching saya yang ikan awak Ø-masak untuk ___
   cat 1SPR COMP fish 2SPR Ø-cook for ___

It is clear from the data that it is not possible to characterize the eligible gap simply in terms of subjecthood. Neither a passive nor a non-passive treatment of the Ø- construction can explain the facts from dialect B, where despite the constituent being the subject, it cannot be relativized. The only constituent that can in fact be relativized in Malay is the initial topic argument. Thus it appears that Keenan and Comrie’s Noun Phrase Accessibility Hierarchy needs to be modified to account for these cases where the only noun phrases that can be extracted are from the topic position.

3. A Reanalysis of the Facts

Let us first, then, consider how topic figures into the syntactic structures of the three constructions that we have been looking at. Under the newly proposed analysis, meng- constructions will have the logical subject, grammatical subject, and topic converge on the initial argument of the clause -- as a non-passive construction, grammatical subject and logical subject are linked, and as a non-topicalized construction, the logical subject and the topic are congruent: e.g. in (1), the initial argument, Mariam, is the topic, logical subject, and grammatical subject.
The di- and Ø- constructions ((2a), (6)), in contrast, differ from the meng-construction because they share in common the property of being topicalized structures: in both these constructions, it is the logical object, doktor itu, that is the topic. However, the di- and Ø- constructions are different in that while the di-construction is a passive structure, the Ø- construction is a non-passive construction. The differences among these three sentences are morphologically marked by the three different verbal prefixes which in effect specify information about the association patterns of the various levels of representation in their lexical entries:

16a. meng- topic = logical subject
   subject = logical subject
b. di- topic = logical object
   subject = logical object
c. Ø- topic = logical object
   subject = logical object

In the entry for meng- both the topic and the grammatical subject are linked to the logical subject of the clause, making them functionally identical. Similarly, di- has both the grammatical subject and topic link to the same semantic argument; this time, however, it is the logical object. Finally, in contrast, while the grammatical subject links with the logical object for the Ø- construction, the topic aligns with the logical object.

A partial phrase structure grammar is, in addition, necessary for the generation
of the three sentence types. The unmarked flat structure is presented, although this in itself is not a crucial feature of the analysis:

17a. \( S \rightarrow NP^*, \ PP, \ V \)  
   b. topic < subject < predicate < object, oblique

This set of phrase structure rules basically state that in any clause, the topic precedes all other functions, followed by a subject in the preverbal position, with objects and obliques in the postverbal position. To demonstrate how the grammar outlined above provides structural descriptions of the different sentence types, phrase structure diagrams are given below:

18a.

```
S
   \( NP \)
      \( topic \)
         \( MENG\text{-pukul} \)
            \( N \)
               \( Mariam \)
         \( det \)
            \( doktor \text{ itu} \)
       \( np \)
```

b.

```
S
   \( NP \)
      \( topic \)
         \( DI\text{-pukul} \)
            \( N \)
               \( det \)
                  \( Doktor \text{ itu} \)
         \( pp \)
            \( oblique \)
               \( P \)
                  \( oleh \)
                     \( N \)
                        \( Mariam \)
       \( np \)
```

c.

```
S
   \( NP \)
      \( topic \)
         \( 0\text{-periksa} \)
            \( N \)
               \( det \)
                  \( Doktor \text{ itu} \)
         \( np \)
            \( subject \)
               \( N \)
                  \( saya \)
       \( np \)
```

Let us first consider the equi obligatory control structures from Section 1. Recall that for these structures, neither Chung’s passive, nor the traditional non-passive analysis of the $\emptyset$-construction, sufficed to explain the facts, in particular, the dialectal split. We contend that in order to understand the facts pertaining to control structures in Malay, the assumption about the identity of the control site; which thus far in syntactic theory, has been unerringly characterized as the grammatical subject has to be changed. However, as we have seen from the data, in Malay the controller cannot merely be characterized as the grammatical subject since we can neither explain dialect B, nor give a reason for the dialectal split. In what follows, we will demonstrate that if, however, we include *topic as part of the definition of the identity of the control site, we can elegantly and simply explain all the facts of equi in Malay. An explanation of the dialectal difference falls out naturally from the degree of restriction the speakers place on the identity of the control site. For ease of reference, the data from (3), (4), (7), (8), (9) are duplicated below as (19) - (21):

19a. Ali menyuruh Mariam [ _ memukul doktor itu]
     Ali MENG-ask Mariam [ _ MENG-beat doctor the]
     Ali asked Mariam to beat the doctor.

b. *Ali menyuruh doktor [Mariam memukul _ ].
   Ali MENG-ask doctor [Mariam MENG-beat _ ]
   Ali asked the doctor to be beaten by Mariam.

20a. Ali menyuruh doktor itu [ _ dipukul oleh Mariam].
     Ali MENG-ask doctor the [ _ DI-beat erg Mariam]
     Ali asked the doctor to be beaten by Mariam.

b. *Ali menyuruh Mariam [doktor itu dipukul _ ].
   Ali MENG-ask Mariam [doktor the DI-beat _ ]
   Ali asked Mariam to beat the doctor.

21 **Dialect A**

a. Ali menyuruh doktor itu [ _ saya periksa].
   Ali MENG-ask doctor the [ _ 1SPR $\emptyset$-examine]
   Ali asked the doctor to be examined by me.

b. *Ali menyuruh saya [doktor itu _ periksa].
   Ali MENG-ask 1SPR [doctor the _ $\emptyset$-examine]
   Ali asked me, the doctor, to examine.

**Dialect B**

c. *Ali menyuruh doktor itu [ _ saya periksa].
   Ali MENG-ask doctor the [ _ 1SPR $\emptyset$-examine]
   Ali asked the doctor to be examined by me.

d. *Ali menyuruh saya [doktor itu _ periksa].
   Ali MENG-ask 1SPR [doctor the _ $\emptyset$-examine]
   Ali asked me, the doctor, to examine.

In dialect B, the claim is that the control site must be a grammatical subject which in addition occupies the *topic position*. Therefore, the *meng*-construction in (19a) is grammatical because the gap in the lower clause is the grammatical subject occupying *topic* position, while (19b) is ungrammatical because it is the *(non-topic)* grammatical object that is the control site. In (20a), the topicalized grammatical subject partakes as the eligible control site, whereas (20b) is not acceptable because the *non-topic* post-verbal oblique is ineligible as a control site. By saying that it is the grammatical subject in the *topic* position that functions
as the control site, the data for the $\emptyset$-constructions, in particular, can be very easily explained. In (21c), although the gap is in the topic position, it is not a grammatical subject, and hence control cannot take place. In (21d), the situation is reversed -- while the gap is a grammatical subject, it is not a topic, and hence cannot qualify as a control site.

The difference between the two dialects, A and B, lies in the way in which the controller is identified in each of the dialects. While dialect B necessitates that the controller still be a grammatical subject as well as topic, dialect A, on the other hand, simply requires the controller to be topic. Hence for the meng- construction in (19a), control is possible because the gap in the lower clause is in the topic position, in contrast with (19b), where the gap is in a non-topic position. Similarly, for the di-constructions in (20), this means that (20a) is an acceptable construction because the control site is in the topic position, whereas (20b) is ungrammatical because its gap is the oblique non-topic position. And finally, for the $\emptyset$-constructions, since the controller in (21a) occupies the topic position, it is eligible as a control site. (21b), in contrast, is not a possible construction in dialect A because although the gap is in the subject position, it is not the topic, and hence is ineligible for control.

Therefore, the difference in the dialects lies in the difference in the constraints that are operative in each of the dialects:

(22) **Dialect A**
The only eligible controller is the topic argument.

(23) **Dialect B**
The only eligible controller is the grammatical subject which occupies the topic position.

Thus, only with the inclusion of topic as a necessary condition on the identity of the controller in equi-constructions can the corpus of data be given a unified account; in particular, the facts of dialect B are explained, and a systematic variation can be found for the dialectal difference.

Similarly, with the the -kah constructions, all that is needed to explain the fact that the initial argument cannot be questioned in every case is to say that the constituent that is questioned cannot be the topic. This follows directly from the definition of topics: topics are those chunks that are presupposed information that is common knowledge in the context. Therefore, the constituent which occupies the topic position cannot be questioned. Put in another way, the constituent that is questioned is the focus, i.e. it is the new information that is to be elicited. And since a constituent cannot be both topic and focus at the same level of clause, it follows that the initial topic position cannot be focussed and questioned.

With the introduction of the topic function, relativization can be simply explained by stating that the only position that allows extraction is the topic position, with the added stipulation that in one dialect, there is an additional constraint put on the topic, requiring it to be grammatical subject as well -- this is the case in dialect B. As with the control facts, speakers of this dialect put more restrictive constraints on what can function as the gap in lower clauses. The
grammars of speakers of dialect A simply have topic as the only eligible gap.

4. Concluding Remarks

In the preceding section, we see that in order to develop an adequate understanding of Malay syntax and accomplish the analyses of the data presented, topic must thus be recognized as a grammaticized function. While many studies have acknowledged the existence of this concept, they have not extended this acknowledgement to show how topic, in some languages, can occupy a syntactic role as prominent as that of subject. Malay is one such language in which without topic, there is clearly a hiatus in our understanding of the syntactic phenomena in that language.

This paper provides convincing evidence that in languages such as Malay, the notion of topic is as important to the syntax as the notions of subject and logical subject. The primary theoretical thrust of the paper as a whole is to argue for concept of topic as a grammaticized function that must be centrally integrated into the syntax of Malay. Control constructions provide crucial motivation for this, since the identity of the control site must necessarily be defined in terms of topic. This conclusion is in turn corroborated by other data on interrogative and relative clause constructions.

Notes

1 Malay is an Austronesian language spoken primarily in the South-East Asian countries of Malaysia, Singapore, and Brunei. It is very closely related to Indonesian, and some of the literature that I refer to is on Indonesian: for the most part, the grammars are very similar.

2 Although essential to sentential syntax, it does not, however, supersede grammatical subject as is suggested by much of the literature on the so-called topic-oriented languages (e.g. Schacter 1976). The facts on Malay show that having topic alone, without subject, is not sufficient to account for the facts.

3 In addition to this, oleh itself is optional, when immediately adjacent to the verb. As mentioned in a previous footnote, there have been alternative analyses of di-. This is, however, beyond the scope of this paper: for a detailed account, see Alsagoff (forthcoming).

4 The exact details as to how the passivization rule is formulated are not relevant to the discussion in this section -- in whatever framework, passivization can be characterized in general terms to involve this change in the pattern of association between the grammatical functions and the thematic roles.

5 Joshi (1989) provides a counter example, and proposes logical subject as the controller in Marathi.

6 It is not possible to say that these sentences are ungrammatical because they contain embedded non-finite clauses which have a fronted constituent, as is the
case with the English sentences:
*Ali asked me [the doctor, _ (to) beat].
These English sentences contain embedded focussed constructions, while the Ø-
construction in Malay is a topicalized construction.

Bibliography

Alsagoff, Lubna (1991) Against an Ergative Analysis of Malay, ms. Stanford
University.

Bresnan, Joan and Jonni Kanerva (1988) Locative Inversion in Chichewa: A
Case Study of Factorization in Grammar CSLI Report.

Bresnan, Joan and Sam Mchombo (1987). Topic, Pronoun and Agreement in
Chichewa. Language 63.4.

Chafe, Wallace, L. (1976) Givenness, Contrastiveness, Definiteness, Subject
Topics and Points of View, in Li, Charles, ed. (1976) Subject and Topic New
York, Academic Press.

Chomsky, Noam (1986) Lectures on Government and Binding. Dordrecht,
Foris.

Chung, Sandra (1976a) On the Subject of Two Passives in Indonesian, in Li
(ibid).

Chung, Sandra (1976b) An Object-Creating Rule in Bahasa Indonesian.
Linguistic Inquiry 7.1.


Joshi, Smita (1989) Logical Subject in Marathi Grammar and the Predicate
Argument Structure WCCFL 8.

Keenan, Edward and Bernard Comrie (1977) Noun Phrase Accessibility and

Schacter, Paul (1976) The Subject in Philippine Languages: Topic, Actor, Actor-
topic, or None of the Above. in Li (ibid).

Object Extraction and the Accessibility of Thematic Information

Alex Alsina and Sam A. Mchombo
Stanford University University of California, Berkeley

An assumption found in many syntactic theories is that semantic or thematic information determines, at most, the representation of arguments in an initial or deep level of syntactic (or pre-syntactic) representation (see, for example, Perlmutter and Postal (1984) in Relational Grammar (RG), and Baker (1988a) in Government-Binding (GB)). The strongest version of this hypothesis is clearly spelled out in Belletti and Rizzi (1988) and in Grimshaw (1990), who claim that, once thematic roles have fulfilled their function of establishing this initial representation (D-structure or argument-structure), they are invisible to syntax, so that no rule of syntax may make reference to them. According to this hypothesis, the “Inaccessibility Hypothesis,” any syntactic asymmetry among arguments with different thematic roles should follow from the thematic difference only indirectly, thanks to the different initial representations determined by the thematic roles.

Genuine counterexamples to this hypothesis are difficult to find because they must reveal a direct effect of thematic roles on syntax, rather than an indirect effect. We claim, however, that certain Bantu languages, specifically Chichewa and Kichaga, provide a bona fide case of a syntactic process which must refer to the thematic content of arguments, as well as to their relative position in the argument structure, and which cannot be accounted for on purely syntactic terms. A proposal will be made to formally integrate this thematic and argument-structure restriction into the theory of grammar.

1. Extraction Asymmetries

It has been observed that certain objects cannot be extracted (that is, cannot be expressed as relative pronouns or displaced question words), and that this restriction depends on the thematic content of the object.\textsuperscript{1} This phenomenon can be observed in applicative and causative constructions in Chichewa. Sentences (1) and (2) are applicative constructions based on transitive verbs introducing a beneficiary and a locative object respectively.\textsuperscript{2}

\begin{itemize}
  \item (1) Kadžidzi a-na-phīk-īr-a njovu maũngu.
  \hspace{1cm} 1a owl 1S-PS-cook-AP-FV 9 elephant 6 pumpkins
  \hspace{1cm} ‘The owl cooked the elephant pumpkins.’
  \item (2) Kadžidzi a-na-phīk-īr-a ku chitsimē maũngu.
  \hspace{1cm} 1a owl 1S-PS-cook-AP-FV 17 7 well 6 pumpkins
  \hspace{1cm} ‘The owl cooked pumpkins at the well.’
\end{itemize}
As shown in Alsina and Mchombo (1990, to appear), the patient object of both types of applicatives can be freely extracted as a relative pronoun, as we see in (3), but the applied objects exhibit a contrast: in active forms, the beneficiary cannot be extracted, (4a), while the locative can, (4b). (Recipient or goal objects behave like beneficiary objects in all respects, whereas instrumental applicatives pattern with locative applicatives in allowing both the applied object and the patient object to undergo extraction.)

(3) a. Maúngú améné kadhídzi a-na-phík-ír-a njóvu ...
   6 pumpkins 6 REL 1a owl 1 S-PS-cook-AP-FV 9 elephant ...
   ‘The pumpkins that the owl cooked for the elephant . . .’

b. Maúngú améné kadhídzi a-na-phík-ír-a ku chitsímé ...
   6 pumpkins 6 REL 1a owl 1 S-PS-cook-AP-FV 17 7 well ...
   ‘The pumpkins which the owl cooked at the well . . .’

(4) a. *Njóvu iméné kadhídzi a-na-phík-ír-a maúngu ...
   9 elephant 9 REL 1a owl 1 S-PS-cook-AP-FV 6 pumpkins ...
   ‘The elephant that the owl cooked pumpkins for . . .’

b. Ku chitsímé kuméné kadhídzi a-na-phík-ír-a maúngu ...
   17 7 well 17 REL 1a owl 1 S-PS-cook-AP-FV 6 pumpkins ...
   ‘At the well where the owl cooked pumpkins . . .’

This restriction on extraction of beneficiaries is not only visible in double object constructions, such as (4a), but also when the beneficiary is the sole object of the verb, as noted by Baker (1988a, 1988b). A beneficiary applicative based on an intransitive verb such as nam-a ‘lie, tell lies,’ in (5a), does not allow its object to be extracted, (5b).

   1 NAME 1 S-PR-lie-AP-FV 2 children
   ‘Chatsalíra is lying for the children.’

b. *Aná áméné Chatsalíra a-kú-nám-ír-a ...
   2 children 2 REL 1 NAME 1 S-PR-lie-AP-FV ...
   ‘The children for whom Chatsalíra is lying . . .’

A similar contrast in extractability arises with the objects of causative constructions. Causatives based on transitive verbs in Chichewá have the causee expressed either as an object, (6a), or as an oblique introduced by the preposition kwá ‘to, by,’ (6b), while causatives based on intransitive verbs have the causee invariably expressed as an object, regardless of whether this argument is an agent, (7a), or a patient, (7b).
(6) a. Nûngu i-na-phîk-îts-a kadzîdzi maûngu.
9 porcupine 9 S-PS-cook-CST-FV 1a owl 6 pumpkins
‘The porcupine made the owl cook the pumpkins.’

b. Nûngu i-na-phîk-îts-a maûngu kwá kádzîdzi.
9 porcupine 9 S-PS-cook-CST-FV 6 pumpkins by 1a owl
‘The porcupine had the pumpkins cooked by the owl.’

(7) a. Chatsalîra a-ku-nâm-îts-á mwâna.
1 NAME 1 S-PR- lie-CST-FV 1 child
‘Chatsalîra is making the child lie.’

b. Mwâna a-ku-d-éts-á zôvâla.
1 child 1 S-PR-be dirty-CST-FV 8 clothes
‘The child is making the clothes dirty.’

With causatives based on transitive verbs, the base patient can be freely extracted, whether the base agent is expressed as an object, (8a), or as an oblique, (8b), but the agent object cannot be extracted, (8c).

(8) a. Maûngu améné nûngu i-na-phîk-îts-a kadzîdzi ...
6 pumpkins 6 REL 9 porcupine 9 S-PS-cook-CST-FV 1a owl ...
‘The pumpkins which the porcupine made the owl cook …’

b. Maûngu améné nûngu i-na-phîk-îts-a kwá kádzîdzi ...
6 pumpkins 6 REL 9 porc. 9 S-PS-cook-CST-FV by 1a owl ...
‘The pumpkins which the porcupine had cooked by the owl …’

c. *Kadzîdzi améné nûngu i-na-phîk-îts-a maûngu ...
1a owl 1 REL 9 porcupine 9 S-PS-cook-CST-FV 6 pumpkins ...
‘The owl that the porcupine made cook the pumpkins …’

Similarly, with causatives based on intransitive verbs, extraction fails with an agent object, (10a), but is possible with a patient object, (10b).

(9) a. *Mwanâ áméné Chatsalîra a-ku-nâm-îts-a ...
1 child 1 REL 1 NAME 1 S-PR- lie-CST-FV ...
‘The child that Chatsalîra is making lie …’

b. Zôvâla zîméné mwâna a-ku-d-éts-á ...
8 clothes 8 REL 1 child 1 S-PR-be dirty-CST-FV ...
‘The clothes which the child is making dirty …’
As these examples show, patient and locative, as well as instrumental, objects can be extracted as relative pronouns, but beneficiary and agent objects cannot. Interestingly, this asymmetry disappears in the passive. In passive forms, not only can an applied locative be extracted, (10a), but so can the beneficiary of applicatives based either on transitive or intransitive verbs, (10b) and (10c) respectively. Similarly, in the passive form of a causative, the contrast in extractability between an agent and a patient disappears: it is possible to extract not only the base patient, (11a), but also the base agent of causatives based either on a transitive, (11b), or an intransitive verb, (11c).

(10) a. Ku chitsímé kuméné ku-na-phík-ír-idw-á máúngu ...  
17 7well 17REL 17S-PS-cook-AP-PAS-FV 6pumpkins ...  
‘At the well where pumpkins were cooked ...’

b. Njovu iméné i-na-phík-ír-idw-á máúngu ...  
9elephant 9REL 9S-PS-cook-AP-PAS-FV 6pumpkins ...  
‘The elephant that was cooked pumpkins ...’

c. Aná ánéné a-ku-nám-ír-idw-a ...  
2children 2REL 2S-PR-lie-AP-PAS-FV ...  
‘The children who are lied for ...’

(11) a. Maúngú ánéné a-na-phík-íts-idw-á kwá kádzidzi ...  
6pumpkins 6REL 6S-PS-cook-CST-PAS-FV by 1a owl ...  
‘The pumpkins which were caused to be cooked by the owl ...’

b. Kádzidzi ánéné a-na-phík-íts-idw-á máúngu ...  
1aowl 1REL 1S-PS-cook-CST-PAS-FV 6pumpkins ...  
‘The owl that was made to cook the pumpkins ...’

c. Mwaná ánéné a-ku-nám-íts-idw-a ...  
1child 1REL 1S-PR-lie-CST-PAS-FV ...  
‘The child that was made to lie ...’

These facts show an asymmetry in extractability in Chichewa between agent and beneficiary (and goal) objects, on the one hand, and instrumental, patient and locative objects, on the other hand, in the active form of verbs. They also show that this asymmetry disappears in the passive.

2. Phrase-Structural Account

A carefully worked out attempt to account for the extraction restriction which affects beneficiary and agent objects is found in Baker (1988a, 1988b): it is taken to follow from the complex phrase-structural representation of applicatives and causatives in that theory. On the one hand, an
applied beneficiary, unlike a basic object or an applied instrumental, is
governed by a D-structure preposition which moves—incorporates—into the verb
leaving a trace. Capitalizing on this phrase-structural difference among ob-
jects, Baker posits a filter, the “Nonoblique Trace Filter,” which rules out
moving the object of an empty preposition to Comp. Thus, the objects of
null prepositions—beneficiary objects—will be blocked from undergoing wh-
movement by this filter, while other objects will be free to extract. On the
other hand, as causative constructions are assumed to have a D-structure in
which the causative affix is a verb which takes a complement clause, an agent
causee appears in the subject position of this clause (the specifier of IP),
while the base object is generated as an object NP. As a result of moving the
embedded VP to the specifier of the CP complement of the matrix causative
verb, from where the embedded verb can incorporate into the causative affix,
the causee cannot move to the matrix Comp position without violating Subj-
jacency (cf. Chomsky (1977)): since the closest Comp position is occupied by
the moved VP, the causee or embedded subject can only move to the matrix
Comp in one step crossing two IPs, which are bounding nodes. The base
object, in contrast, having moved to the embedded Comp as a result of VP
movement, can then move to the higher Comp without violating Subjacency.

The first objection one can make to this account is that two different
principles are appealed to in order to account for the same phenomenon: an
ad hoc filter, in applicative (or dative shift) constructions, and Subjacency,
in causative constructions. One can confidently assume that it is the same
phenomenon because the extraction restriction (a) yields the same degree of
unacceptability in both constructions, (b) disappears in the passive in both,
and (c) is found in other languages, such as Kichaga, in both constructions.
Bresnan and Moshi (1990) observed that Kichaga has a restriction on ex-
traction of beneficiaries similar to that of Chichewa. The beneficiary object
mana ‘child’ of (12a) cannot be extracted to form a relative clause in (12b).

(12) a. Mama n-a-le-kolr-i-a mana malruwu (ruko-nyi).
    1 mother FOC-1 S-PS-cook-AP-FV 1 child 6 bananas 5 kitchen-LOC
    ‘The mother cooked bananas for the child (in the kitchen).’

b. *Mana [s, a-le-kolr-i-a malruwu] nyi icu.
    1 child 1 S-PS-cook-AP-FV 6 bananas COP 1 this
    ‘The child for whom she cooked bananas is this.’

Likewise, the agent object in a causative in Kichaga, such as (13a), also
fails to undergo extraction in a relative clause, as in (13b).

(13) a. Mama n-a-i-sanj-ilr-a mana numba (mlri-nyi).
    1 mother FOC-1 S-PR-thatch-CST-FV 1 child 9 house 3 village-LOC
    ‘The mother is causing the child to thatch the house (in the village).’
Consequently, a unified account of the restriction seems desirable.

Alsina and Mchombo (1990) point out several problems with Baker’s account of the extraction restriction in applicative constructions. First, it is observed that the “Nonoblique Trace Filter” does not distinguish active and passive forms and incorrectly rules out the extraction of a beneficiary NP in both structures, although it is grammatical in the passive in Chichewa, as shown in (10b-c). Second, it is noted (also in Bresnan and Moshi (1990)) that, since locatives would be treated as PPs in Baker’s framework very much like beneficiaries are, extraction of locative objects should also be ruled out by this filter, contrary to fact, as seen in (4b). Third, this filter would incorrectly rule out certain grammatical sentences in Kichaga. Kichaga differs crucially from Chichewa in allowing an argument other than the beneficiary to be the subject in the passive form of a beneficiary applicative (cf. Bresnan and Moshi (1990)). Specifically, the optional locative in (12a) may be the passive subject, as in (14a), and the extraction of the beneficiary object in this construction is grammatical, as shown in (14b). As argued in Bresnan and Moshi (1990), the beneficiary must be analyzed as an object in this construction.4

(14) a. Ruko-nyi ku-le-kolr-i-o mana malruwu.
   5 kitchen-LOC 17 S-PS-cook-AP-PAS 1 child 6 bananas
   ‘In the kitchen were cooked bananas for the child.’

b. Mana [s, ku-le-kolr-i-o malruwu] nyi icu.
   1 child 17 S-PS-cook-AP-PAS 6 bananas COP 1 this
   ‘The child for whom there were cooked bananas is this.’

This example is very problematic for any attempt to account for the extraction restriction on purely phrase-structural terms: there is no configurational difference between the beneficiary object in (14b), which allows extraction, and the beneficiary object in (12b), which resists extraction. In both cases, for Baker (1988a, 1988b), it is the object of an empty preposition and has moved directly to Comp.

As for causatives, Baker’s account of the extraction restriction hinges on the assumption that all causatives in Chichewa are derived through VP-to-Comp movement (movement of the embedded VP to the specifier of CP, from which the verb can incorporate into the matrix causative affix). If we take, for the sake of illustration, a causative based on an intransitive verb in Chichewa, the S-structure which Baker (1988a) proposes for it would be as shown in (15):
The movement of the embedded VP to the specifier of its CP leaves this position unavailable for any further movement of a maximal projection originating in the embedded IP. In this way the causee ‘mwaná,’ which is the subject NP* of the embedded IP cannot move to the specifier of the matrix CP as would be required for relativization: it would be crossing two bounding IP nodes in one step since the closest Comp position is not free. So, sentences such as (9a) are ruled out as Subjacency violations in Baker (1988a).

When the base verb is transitive, a derivation involving VP-to-Comp movement is designed to produce causatives whose causees are expressed as oblique phrases, of the type illustrated in (6b). However, the existence of causatives based on transitive verbs whose causees are expressed as objects, exemplified in (6a), although not considered in Baker (1988a), would require V-to-C movement. This is necessary in Baker’s framework in order for the causee NP to receive structural Case enabling it to behave as the primary object of the causative structure, while the basic object is assigned possibly inherent Case. Consider in (16) the S-structure of a causative construction based on a transitive verb derived through V-to-C movement in Baker (1988a).

In this structure, the embedded verb, being a lexical category, moves to the head of CP (via Infl), rather than to the XP position in CP. From there it incorporates into the causative verb. As the specifier of CP is not filled by the incorporating V, unlike what happens with VP-to-Comp movement, it is
free to be occupied by a maximal projection. This will allow either the causee NP*, as indicated by the arrows in (16), or the basic object NP† to move to the specifier of the embedded CP and, from there, to the higher Comp position as is required in relative constructions. In neither case is Subjacency violated, since at most one bounding IP node is crossed at each step. In this way, Baker’s theory, when extended to account for double-object causatives such as (6a), fails to predict the contrast in extractability between the causee object and the basic (patient) object of causatives illustrated in (8).

In fact, when we submit Baker’s theory to a close scrutiny, we find that even the explanation that it is supposed to provide for the contrast in extractability among objects of single-object causatives does not hold. Baker’s explanation for why the agent causees of causatives based on intransitive verbs fail to undergo extraction crucially relies on the assumption that such causatives in Chichewa are always formed through VP-to-Comp (rather than V-to-C) movement in the embedded CP. There is, however, no reason why the V-to-C alternative should be excluded in the formation of causatives based on intransitive verbs. Baker (1988a, 199) himself notes: “Since the [intransitive] verb has no object that needs Case, there is no reason it must take
the VP along.” So, if these causatives can be formed through the movement of the embedded verb to the head of CP, the specifier of CP will be left free as a landing site for any maximal projection within the CP, just as in (16). Consequently, the agent causee will be able to move to the matrix Comp via the embedded Comp, without violating Subjacency, in the same way that the basic object of a transitive verb or the single argument of an unaccusative are. So, Baker’s theory does not predict the contrast shown between (9a), on the one hand, and (8b) and (9b), on the other. In conclusion, the bi-clausal phrase-structural representation that in Baker’s theory is attributed to causatives does not provide any explanation for the contrast in extractability observed among the objects of causative constructions in Chichewa.

There have been other theories which attempt to account for the extraction restriction, specifically in the English “dative shift” construction, on the basis of the particular phrase-structural configuration of the beneficiary (and goal) object. All of them (Jackendoff and Culicover (1971), Oehrle (1975), Stowell (1981), and Kayne (1984)) attribute the unextractability of this object to the fact that it is the first in a sequence of two NP objects in English. Whatever the merits of these proposals, they cannot account for the facts of Chichewa and Kichaga. We have shown that the extraction of beneficiary and causee objects in Chichewa is not only ungrammatical when there is another object in the clause, but also when it is the sole object of the verb, as in (5b) and (9a), and that the first in a sequence of two object NPs can be extracted in Kichaga, (14b). (In this example, for a theory like GB, the extracted beneficiary is moved from the first of two NP positions in the VP, because the beneficiary NP linearly precedes the patient NP, when both are expressed in the VP, as in (14a)—the reverse order is ungrammatical. The same point can be made for the causee with example (ib), fn. 4.)

Given the inadequacy of accounts of the extraction restriction based purely on phrase structure, we shall now consider an alternative approach.

3. A Thematic Hierarchy Account

Our claim is that the right way of expressing this restriction must take into account the position of arguments within the argument-structure and (at least some aspect of) their thematic content. We assume that arguments in individual argument-structures are ordered by their thematic role according to the Universal Hierarchy of Thematic Roles (17), so that more prominent roles appear to the left of less prominent roles.

(17) \[ ag > ben > go > ins > pt > loc \]

This allows us to define the “logical subject” of a predicate as the highest thematic role. It is generally the unmarked subject of an active verb, and it is also the argument which is suppressed in the passive construction. A
suppressed argument cannot be expressed (as an argument), but, in certain cases, may license the use of an adjunct thematically bound to it, such as the passive by-phrase (cf. Bresnan and Kanerva (1989), Grimshaw (1990), etc.).

The extraction restriction brings into play a major split in the thematic hierarchy: the roles which are subject to a limitation on extraction are those in the upper half, i.e., agent, beneficiary and goal. The same split is visible in noun incorporation in languages which allow it: only arguments equal to or lower than instrumental can be incorporated (cf. Allen, Gardiner and Frantz (1984), Baker (1987, 1988a), Mithun (1984)). Finally, the existence of objects which cannot acquire the subject function in passives (inherently Case-marked in Baker (1988b) and Machobane (1989), or restricted objects in Alsina and Mchombo (to appear) and Bresnan and Moshi (1990)) points to the same split in the hierarchy: at least in some languages, these objects can only be roles in the lower half of the hierarchy (instrumental, patient, locative). These facts suggest that the split in the thematic hierarchy has to be part of the design of universal grammar. In what follows, we shall explore a possible representation of this hierarchical split which will provide an understanding of the extraction restriction.

There is a certain conception of grammar which assumes that different types of linguistic information are factored out into different levels of representation which are related to each other (Bresnan and Kanerva (1989), Bresnan (1990), T. Mohanan (1990), etc.). Within this conception, we propose that semantic arguments and syntactic functions are represented on different planes or tiers, and that the two tiers are related to each other in very much the same way that the tiers of autosegmental phonology are: each argument is mapped onto a syntactic function, and this mapping is indicated by means of an association line. As in autosegmental phonology, we shall assume that lines cannot cross. However, unlike autosegmental phonology, in which the different tiers are assumed to be parallel, we shall assume that arguments and functions are represented on intersecting planes. A crucial aspect of this representation is the point of intersection: the function plane intersects the argument plane exactly between goal and instrumental. So we shall assume that the thematic hierarchy imposes an ordering on arguments descending the oblique line in (18), and that the higher roles (agent, beneficiary and goal) are placed above the function plane, while the lower roles (instrumental, patient and locative) appear below it.

This representation provides an immediate explanation for the split in the thematic hierarchy with respect to noun incorporation. We place the verb or predicate at the bottom of the hierarchical sequence of arguments, closest to the lowest of its arguments, consistent with the interpretation that lower roles are semantically composed with the predicate earlier than roles higher in the hierarchy (Kiparsky (1988), Bresnan and Kanerva (1989)). A noun
whose thematic role is instrumental or patient can incorporate into the verb, as shown in (17), because the connecting lines do not cross any lines. But noun incorporation is not possible for a role above the function plane, such as beneficiary, because the line connecting it to the verb would have to cross the function plane, and there would be a crossing of lines.

(18) Argument Plane → ag
    ben ————
    Function Plane ————
    go
    ins
    pt ————
    loc ————
    V

Basic for understanding the extraction phenomenon is the idea that arguments are not only mapped onto grammatical functions such as subject and object, but can also be mapped onto grammaticized discourse functions such as topic. According to standard assumptions in Lexical Functional Grammar, a relativized constituent bears the syntactic function of topic (Bresnan and Mchombo (1987)), which we shall refer to as the Rel(ative) Top(ic). Just as thematic roles decrease in prominence in a left-to-right ordering, we also expect to find this arrangement by prominence to hold of syntactic functions. As discourse functions such as Rel Top (and Focus) are more prominent than non-discourse functions, we shall assume that the former are placed to the left of the latter. There is no fixed ordering imposed on non-discourse functions such as subject and object, since their position is determined by the mapping principles proposed in work by Bresnan and Moshi (1990) and others.

We can now see how our proposal captures the extraction restriction. Let us consider the contrast observed in (3a) and (4a), which shows that, in an active form, it is possible to extract a patient, but not a beneficiary, object in Chichewá. In (19) we see the three arguments of the beneficiary applicative phik-ir-a ‘cook for’ ordered along the oblique argument plane, with lines connecting to their syntactic functions on the horizontal function plane. Since this is the active form, the agent is mapped onto the subject function and the beneficiary and the patient are mapped onto objects. The additional link of an argument to the discourse function of Rel Top is subject to the prohibition on crossing of association lines. Notice that the patient can be associated with this function without crossing lines, whereas the beneficiary cannot be associated with it because it would produce a line crossing violation. The agent subject can also link to the Rel Top without crossing lines.
In this way we account for the fact that beneficiary (and goal) objects in active forms fail to undergo extraction in both Chichewá (see examples (4a) and (5b)) and Kichaga (example (12b)). The same explanation applies to causee objects in causatives. Since an agent causee is hierarchically lower than the causer, it appears in the same position as the beneficiary in (19) and is subject to the same inability to link to the Rel Top. Thus, we also explain the extraction restriction of agent causees in active forms in both Chichewá (examples (8c) and (9a)) and Kichaga (example (13b)). In contrast with these cases, arguments which are placed below the function plane (instrumental, patient, locative) are not subject to the extraction constraint because they can link to the Rel Top without crossing lines (see (3), (4b), (8a-b), and (9b)).

Our proposal also explains why the extraction constraint disappears in passive forms. If we take the passive form of the beneficiary applicative *phik-ir-a*, the mapping of arguments to functions will be as in (20):

Since the logical subject is suppressed in a passive form, it has no mapping onto the function plane. Therefore, the agent in (20) has no association line with any syntactic function. As a result of this lack of link of the agent, the beneficiary can map onto the Rel Top without crossing any line. Thus, we explain the puzzling fact that the extraction constraint disappears in passive forms. This is the case in Chichewá both with beneficiaries and agent causees (examples (10b-c) and (11b-c)). It is also the case in Kichaga, but this language, unlike Chichewá, can have a beneficiary expressed as an object in a passive form (example (14a)). Interestingly, even with this assignment of syntactic function, the beneficiary can be relativized, as in (14b). This
follows from our proposal: in a representation like (20), the beneficiary would map onto an object in the function plane, and some other, lower, role would map onto the subject; provided the highest role has no link to the function plane, the beneficiary is free to map onto the Rel Top.

In conclusion, we have presented a problem for the hypothesis that thematic information is not accessible to rules or principles of syntax, and we have shown the difficulties that certain syntactic approaches have in solving that problem in a way that is consistent with the Inaccessibility Hypothesis. Our proposal has been to integrate the relevant thematic information (whether a role is hierarchically lower than goal or not according to (17)) into the architecture of linguistic theory. Thus, we explain an otherwise mysterious restriction on extraction of objects.

Footnotes

0This study is based upon work supported in part by the United States National Science Foundation under Grant No. BNS-8919880, and in part by the Center for the Study of Language and Information, Stanford University. The Chichewa data in this paper reflect the judgments of Sam Mchombo, and the Kichaga data were provided, in work with Alex Alsina, by Lioba Moshi, to whom we are very grateful. Comments from Smita Joshi and, especially, Joan Bresnan have proved very fruitful.

1This was noted by Baker (1988a, 1988b) for Chichewa, and similar facts have also been pointed out for other languages, such as Chamorro and English (see Baker (1988a, 292–99)).

2Tones and vowel length are marked in the Chichewa sentences as follows: long vowels may be low ´, high ´, rising ´, and falling ´, and short vowels are either high ʼ, or low, unmarked. Each Bantu noun belongs to one of eighteen noun classes, denoted in the glosses by Arabic numerals. The following abbreviations are used:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>subject</td>
</tr>
<tr>
<td>FOC</td>
<td>focus</td>
</tr>
<tr>
<td>PS</td>
<td>past</td>
</tr>
<tr>
<td>PR</td>
<td>present</td>
</tr>
<tr>
<td>REL</td>
<td>relative</td>
</tr>
<tr>
<td>LOC</td>
<td>locative</td>
</tr>
<tr>
<td>COP</td>
<td>copula</td>
</tr>
<tr>
<td>CST</td>
<td>causative</td>
</tr>
<tr>
<td>PAS</td>
<td>passive</td>
</tr>
<tr>
<td>AP</td>
<td>applicative</td>
</tr>
<tr>
<td>FV</td>
<td>final vowel</td>
</tr>
</tbody>
</table>
(i) a. Mlri-nyi ku-i-sanj-ilr-o mana numa.  
3 village-LOC 17S-PR-thatch-CST-PAS 1 child 9 house  
‘In the village the child is caused to thatch the house.’

b. Mana [<s, ku-i-sanj-ilr-o numa] icu. 
1 child 17S-PR-thatch-CST-PAS 9 house COP 1 this  
‘The child who is caused to thatch the house is this.’

The contrast between (13b) and (ib) shows that passive morphology is crucial for allowing the extraction of the agent causee. Although the grammatical examples of extraction of a beneficiary and a causee in Kichaga given in this paper, (14b) and (ib) respectively, only show that it is possible to extract these arguments when they are expressed as objects, extraction is also possible, as in Chichewa, when they are expressed as the passive subjects.

5This is the hierarchy proposed in Kiparsky (1988) and in Bresnan and Kanerva (1989, in press). See also references cited in these works.

References


The Agreement Hierarchy and Grammatical Theory
Michael Barlow
California State University, San Marcos

It is a decade since Corbett proposed the agreement hierarchy (Corbett 1979, 1983) to capture empirical generalizations about syntactic and semantic agreement with respect to number and gender marking. Building on the cross-linguistic investigations of polite plural marking in Comrie (1975), Corbett formulated a hierarchy of types of agreement consisting of two parts: first, the identification of different agreement domains, corresponding to different targets, e.g., attributive adjective, predicate, pronoun, etc., and secondly, the statement of regularities concerning the relative influence of syntactic versus semantic agreement among these domains.

It is particularly worthwhile examining the nature of Corbett's agreement hierarchy because if the interpretation of the hierarchy is correct, then it poses problems for the treatment of agreement within all major grammatical theories including Government-Binding Theory (GB), Generalized Phrase Structure Grammar (GPSG), Head-Driven Phrase Structure Grammar (HPSG), and Lexical-Functional Grammar (LFG). In addition it poses difficulties for particular accounts of agreement, including Barlow (1988), Lapointe (1980, 1988) Dowty and Jacobson (1989), and Zwicky (1987).

In this paper I will present four ideas related to the agreement hierarchy:
1. The agreement hierarchy presents problems for all the major grammatical theories.
2. It is not possible to divide agreement phenomena into two domains.
3. The agreement hierarchy is not what it seems to be.
4. A reasonable reformulation of the agreement hierarchy can be given in terms of a discourse-based theory of agreement.

Let us start with a simple example from English. In (1) the verb are agrees with the subject the expatriates. I will call the subject the primary source and the verb the secondary source. (For justification, see Barlow 1990.) In (1) the agreement is regular in that the agreement features associated with the secondary source are identical to the agreement features of the primary source.

(1) The expatriates are talking.

In this paper I will examine patterns of agreement illustrated by the Modern Standard Arabic and Polish sentences in (2). In particular, I will focus on sentences such as (2)a in which the morphosyntactic form of the secondary source may differ from the morphosyntactic form of the primary source and those such as (2)b where one of the secondary sources is identical in form to the primary source, while the other secondary source differs in form from the primary source.

(2)a. al-jimaalu naam-at
    the-camel.MASC.PL slept-FEM.SG
    ‘The camels slept.’

(Mod. Stan. Arabic)
b. Wy bedziecie chora (Polish)
you.PLUR will-be.PLUR ill.SG
‘You will be ill.’ (Corbett 1979)

The Agreement Hierarchy

Corbett has shown that there are cross-linguistic and language-internal regularities in the patterning of agreement forms. The examples in (3) (from British English) can be used to illustrate his claims. Corbett (1983:9) notes that committee is “singular in form, but refers to more than one individual; plural agreement with it ... is therefore semantic agreement.” The attributive position (the demonstrative pronoun here) must exhibit syntactic agreement, while the predicate may show semantic agreement.

(3) a. The committee has decided.
b. The committee have decided
c. This committee sat late.
d.*These committee sat late.

The content of the agreement hierarchy is usually summed up in something like the following terms: Semantic agreement is more likely to occur (and syntactic agreement is less likely to occur) with increasing syntactic distance between the primary source and secondary source of agreement. In other words, once semantic agreement is allowed at a certain position in the hierarchy (in a given language), then it is allowed in all the positions to the right.

The domains of the agreement hierarchy originally formulated by Corbett (1979) are shown in (4). The domains are defined in terms of different secondary sources of agreement.

(4) attributive – predicate – relative pronoun – personal pronoun

Although Corbett has extended the basic hierarchy in later publications, for the present discussion it is sufficient to consider the original form of the hierarchy in which there are four domains (positions) of agreement ranging from attributive position to cross-sentential anaphora without a major break.

Most grammatical theories cannot handle any kind of variation in agreement forms, much less, capture the patterns of regularities in the agreement hierarchy. For example, a feature matching or coindexing account of agreement is inadequate (because of examples such as (2)b). An obvious way for feature-copying accounts to deal with variation is to postulate two kinds of agreement processes, which we might label as a syntactic relation and a semantic relation. Taking this approach leads to a further problem: controlling the operation of these two agreement relations so that they work together (or avoid working together). What is in control of these processes? In a particular instance, which of the two kinds of agreement will operate?

As far as I know, no one has pursued this control issue. No one has struggled with the problem of competing agreement processes and attempted to resolve the question of whether a verb, for example, will show syntactic or semantic agreement. (See Morgan 1984, for some English examples and discussion.) Many theories have avoided this control problem by having the two agreement relations operate in complementary domains. In other words, for a given language and for a
given agreement position, it is assumed that the agreement will always be syntactic (or always be semantic). The advantage of this kind of proposal is that there is no need to worry about controlling the potential interference of syntactic and semantic agreement operations since it is clear—according to the theory—which process is operating. However, these theories face the problem that the two-domain solution conflicts with the findings of Corbett’s agreement hierarchy.

Several two-domain accounts of agreement have been proposed:

(i) NP-internal vs. NP-external (Moravcsik 1978)
(ii) Sentence-internal vs. Cross-sentential

**NP-internal vs. NP-external agreement**

Moravcsik (1978) draws a distinction between NP-internal and NP-external agreement based on gender agreement. She states: “the occurrence of semantic or natural gender agreement within the NP implies such agreement outside it in the same language.”

Moravcsik’s proposal differs from Corbett’s with regard to the status of relative pronouns. According to Moravcsik’s definition, relative pronouns, as NP constituents, should be more open to syntactic agreement than predicates (although she does not in fact discuss relative pronouns); whereas, according to Corbett, they should be more open to semantic agreement. The evidence presented by Corbett to support his position on this matter seems quite convincing. Furthermore, the *who/which* distinction in English is consistent with a view of relative pronouns as leaning towards the semantic domain. (See Barlow 1988:38–40.)

While the evidence may indicate that it is not correct to posit NP-internal versus NP-external as a major dividing line, the simple fact that Moravcsik proposes this distinction and gives evidence in support of it casts some doubt on the viability of alternative candidates for a major boundary distinguishing the two types of agreement.

**Sentence-internal vs. Cross-sentential agreement**

If agreement is assumed to be syntactic, then the sentence is a natural boundary for agreement, since the sentence is the most natural unit of syntax. In general, however, the sentence boundary is not taken as the appropriate limit of syntactic agreement, because that would entail treating intra-sentential anaphora (such as (5)), as an agreement phenomenon, and thus essentially different from cross-sentential anaphora, as in (6). The more usual claim, which is discussed in the next section, is that the major distinction is between syntactic and anaphoric agreement.

(5) John said he would leave.
(6) I saw John. He was leaving.
Local vs. Anaphoric agreement

Local (or grammatical) versus anaphoric agreement is a standard distinction made in function-argument or subcategorization accounts of agreement. This distinction is widely held—though rarely discussed. There are two theoretical accounts of the distinction. One is given in a series of papers by Bresnan and Mchombo (1987a, 1987b); the second is outlined in Zwicky (1987).

The local/anaphoric distinction in Bresnan and Mchombo’s LFG account is not based on different syntactic domains, but rather on differences in functional structures; nevertheless, the distinctions made are similar in spirit to syntactic proposals such as Zwicky’s.5

One important characteristic of Bresnan and Mchombo’s analysis is that it does not entail the postulation of a universal syntactic boundary controlling or associated with the distinction between local and anaphoric agreement. Thus, for example, subject-verb agreement may be local in one language and anaphoric in another.

Bresnan and Mchombo’s position on the distinction between grammatical and anaphoric agreement is summed up in the following quote.

In grammatical agreement, an NP bears an argument relation to the verb, and the verbal affix expresses redundantly the person, number, and gender class of the NP. In anaphoric agreement, the verbal affix is an incorporated pronominal argument of the verb, and the coreferential NP has a non-argument function.

(Bresnan & Mchombo 1987a:1–2)

The distinction between agreement and anaphora in LFG accounts is associated with a cluster of properties such as whether the entity acts as an argument or not. And as the quote indicates, grammatical agreement entails identity of features, while anaphoric agreement allows feature conflicts. The LFG account appears to be promising as a framework that can handle variability of agreement forms. Where there is conflict of agreement features, such as (2a), then we would know that anaphoric agreement is at work. Where there is no conflict, we would have to take a closer look to find out whether the agreement was local or anaphoric.

One problem with the LFG account is that the domains for each kind of agreement are fixed for each language. So in Chichewa, for example, Bresnan and Mchombo state that the relation between subject and subject affix on the verb is grammatical agreement (which suggests strict feature identity). On the other hand, the relation between the object and the object affix of the verb is anaphoric.

Bresnan and Mchombo clearly show that there is a difference in the behaviour of the subject and object affixes; however, it is not clear that this difference should be bundled with the distinction between strict and non-strict agreement. The tight connection between type of agreement and syntactic or functional position indicates that Bresnan and Mchombo favour a two-domain account of agreement. As noted above, such theories cannot account for the data captured by the agreement hierarchy.

Furthermore, it turns out that a conflict of features can be found for all the agreement secondary sources in Chichewa (suggesting that anaphoric agreement occurs across the board). It is possible to get a singular primary source associated with a plural secondary source because politeness in Chichewa is marked by use of a plural on the agreeing category. Thus if the primary source refers to a human,
plural secondary source may be used to indicate respect as in (7) from Corbett and Mtenje (1987:10).

(7) bambo anga
    father. SG    PÓSS.PLUR
    'my father' (respectful)

The singular form of the secondary source "would be inappropriate" according to Corbett and Mtenje (1987:10). This shows that even though an LFG account allows different kinds of agreement relations, it is unable to account for the patterns of the agreement that are found. In one sense, the LFG account is too strong—it imposes a distinction between grammatical and anaphoric agreement once and for all (for a particular language).

Zwicky (1987) also attempts to establish a distinction between local and anaphoric agreement. According to Zwicky, anaphoric agreement "is a matter of semantics and pragmatics"; local agreement "properly belongs to syntax" (1987:6). Zwicky puts forward six criteria in support of the distinction between local and anaphoric agreement. It is argued in Barlow (1988:145–151) that these criteria do not support a clear distinction between two types of agreement, but whatever the status of Zwicky's criteria, it is not clear how the local/anaphoric distinction would fit with the patterns of variation captured by the agreement hierarchy.

Syntactic vs. semantic agreement according to Corbett

It is important to be clear about what is meant by syntactic and semantic agreement. The term syntactic agreement is generally used to refer to cases in which the form of the secondary source is dependent on the morphosyntactic form of the primary source. Semantic agreement, on the other hand, occurs when the form of the secondary source depends on the nature (or properties) of the referent associated with the primary source.

To understand the content of the agreement hierarchy, it is necessary to analyse Corbett's use of the terms syntactic and semantic agreement, which differ from the characterization given above. It is helpful in this regard to realize that Corbett's use of these terms are based exclusively on the form of primary and secondary sources, rather than on a determination of whether agreement dependencies are syntactically or semantically motivated. It turns out that syntactic and semantic agreement are convenient labels, which indicate the strength of syntactic links (Corbett 1983:244). If the form of the secondary source is identical to the form of the primary source, then agreement is said to be syntactic. If the form of the secondary source differs from the form of the primary source, agreement is said to be semantic.

The tensions inherent in Corbett's notion of semantical agreement are particularly apparent in the treatment of polite plural agreement. In examining the polite plural pronoun vy 'you' found in several Slavic languages, Corbett (1983:43) states:

The controller in question, honorific vy, is plural but has a singular referent. This means that plural agreement is syntactic, and singular agreement is semantic.

This seems straightforward; the singular marking on the secondary source is consistent with the singular individual referred to. In this situation the form of the
secondary source is different from the primary source and the form of the secondary source is semantically justified.

However, the use of plural forms to indicate politeness is just the kind of information that can be indicated either by the primary source or by the secondary source (cf. Barlow 1988), and so it is quite possible to have a singular primary source with a plural secondary source indicating polite reference—as we saw in the Chichewa example in (7).

In this example the form of the secondary source differs from the form of the primary source, as above, but it is not justified semantically because the secondary source is plural, but the referent is a single individual. Hence there is a conflict in the two components of Corbett’s notion of semantic agreement, i.e., the nonidentity of features versus a general notion of semantic (referential) justification.

Is the plural marking on the secondary source in (7) indicative of syntactic agreement (because it is not semantically justified, the referent being a single individual) or is it indicative of semantic agreement (because it is not syntactically justified, there being a feature conflict with the singular morphology on the primary source)? In short, is the plural form of the secondary source due to syntactic or semantic agreement in this case? According to Corbett (1983:24–25), it is semantic; even though the referent is singular, because there is a mismatch of features between the primary source and secondary source. Thus the use of the term semantic by Corbett is really indicating a feature conflict, a lack of strict syntactic agreement, which may or may not be due to a semantic influence.

Thus it is clear that Corbett is not proposing a major division between syntactic and semantic agreement based on totally different kinds of agreement dependencies. Corbett (1983:83) states: “we can conclude that syntactic and semantic agreement is a matter of degree.” Furthermore, a careful reading of Corbett (1979:203–204) confirms the fact that the terms syntactic agreement and semantic agreement are used in a restricted sense.

We can conclude that the dimension underlying the agreement hierarchy is feature identity versus feature discord. Feature identity is associated with the left of the hierarchy; feature discord, with the right of the hierarchy.

**Discourse-Linking Theory**

The descriptive inadequacies of two-domain accounts with respect to the two kinds of agreement and the inability of these accounts to capture the generalizations associated with the agreement hierarchy suggests that the fundamental conception of agreement relations is misguided and needs to be revised.

I would like to give an account of the agreement hierarchy within Discourse-Linking Theory as formulated in Barlow (1988). The central idea in an account of agreement within this theory is that at least as far as person, number, and gender agreement are concerned, there is no syntactic agreement relation, nor any semantic agreement relation. Agreement is viewed as a relation between discourse entities.

Discourse-Linking Theory has three main components: (i) the instigation of primary discourse referents by nouns, and secondary discourse referents by agreement morphemes, (ii) a series of mappings from agreement features to
properties, and (ii) the linking of certain discourse referents that contain compatible properties.

In this part of the paper I will present a brief, informal outline of the theory, then provide an illustration of the way the theory works, and finally reformulate the agreement hierarchy in terms appropriate to a discourse account of agreement.

I assume that the utterance of an NP instigates a discourse referent and that the discourse referent is associated with certain properties. Of interest here are the properties that are indicated by the morphological form of the NP. A singular NP may indicate one property—such as being an individual.

In addition, some sort of secondary discourse referent is instigated by the use of nominal morphology associated with what we have been calling secondary sources or agreement targets. Once again the nominal morphology associated with the secondary source indicates the properties of the secondary discourse referent. Some examples of mappings between nominal morphology (indicated by square brackets) and properties or interpretations (indicated by angle brackets) are given in (8).

(8)a. [NUM: SG]       --->      <INDIVIDUAL(x)>
b. [NUM: PLUR]       --->      <COMPOSED-OF-INDIVIDUALS(x)>   
c. [PER: 3]          --->      <NON-SPEAKER/HEARER(x)>   

Part of the grammatical specification of a language consists of a set of mappings such as those in (8). The information in these mappings, which can be extracted from the description of a language in a good grammar, simply indicates the interpretation of morphological forms. These mappings can be thought of as the interpretations associated with grammatical features.

There are two points to note about these mappings. First, since grammatical morphemes are often polysemous, the mappings may be one-to-many. Second, the mappings may be sensitive to particular syntactic categories. For example, within a particular language a plural morpheme associated with a verb may indicate a different property from a plural morpheme associated with a predicate adjective.

The third part of the theory is the linking of discourse referents. We can think of the secondary discourse referent as being linked to or being a part of the primary discourse referent. (The persistence of some discourse referents through a discourse is due, in part, to this linking.) There are different conditions governing the linking of discourse referents, but the main idea is that the properties associated with the linked discourse referents must be compatible.

Let me remind you once more that the linking of properties in primary and secondary discourse referents is the "agreement relation" in this theory; there is no syntactic agreement.

Most of the feature conflicts that occur in traditional accounts where the features of the primary source and secondary source are linked by a morphosyntactic relation do not lead to an equivalent conflict of properties within a discourse account. To illustrate this, let us look at the Arabic example (2)a, repeated here as (9).

(9) al-jimaalu  naam-at
    the-camel.MASC.PL  slept-FEM.SG
    'The camels slept.'
The features MASC.PLUR on the source NP instigate a primary discourse referent with the properties shown in (10).

(10) \textless 
\text{IN-NOUN-CLASS} (x) \\
\text{COMPOSED-OF-INDIVIDUALS} (x) \\
\textgreater 

The features FEM.SG on the verb are associated with the properties of a secondary discourse referent. Feminine singular morphology has several interpretations in Arabic, but one common interpretation is non-human plural, as shown in (11).

(11) \textless 
\text{NON-HUMAN} (x) \\
\text{COMPOSED-OF-INDIVIDUALS} (x) \\
\textgreater 

It is not possible here to go into the details of discourse-linking, but it is clear that the properties in (10) and (11) are compatible and the two discourse referents can merge.

I would like to suggest that feature conflicts indicate a situation in which new or extra information about referents is being encoded. Assuming this to be the case, then we have a new question concerning the agreement hierarchy: Why is the extra or new information associated with the right of the hierarchy more than with the left of the hierarchy?

Towards the left of the hierarchy, the agreement morphemes are likely to encode the same set of properties as the noun primary source. In other words, if a particular morpheme-property mapping is appropriate for the noun, then towards the left of the hierarchy an identical mapping is likely to hold for the agreement marker. In this case, the agreement morpheme supplies redundant information concerning the intended referent. This might be considered as a simple reidentification of the intended referent.

On the right of the hierarchy there is a greater possibility that the agreement morphemes will be associated with properties that differ from the noun morphemes. The morphemes on the right of the hierarchy are more likely to introduce new information about the intended referent.

There are several explanations or speculations about this pattern that can be given in terms of the processing of information in a discourse. The role of agreement morphemes can be viewed in two ways: as an identification (or reidentification) of the intended referent or as an elaboration of the characteristics of the intended referent. It is plausible to assume that in the initial stages of introduction of a referent in the discourse it is necessary to provide a clear identification of the discourse referent. If this is the case, it will lead to the specification of the same properties by the agreement morphemes as are indicated by the noun. Once established, however, there is the possibility of either adding new features to indicate new information about the discourse referent or identifying the primary discourse referent by use of fewer properties than were used initially.

Furthermore, as the discourse continues it is reasonable to expect that there will be some decay in the salience of the noun used to instigate the primary discourse referent and a concomitant increase in the salience of actual referents and other contextual information in the discourse situation. For example, there is an increasing tendency to indicate natural gender rather than grammatical gender.
Whether or not these speculations are along the right lines, we can at least provide a descriptive restatement of the agreement hierarchy as follows:

(12)

Moving to the left in the hierarchy, the more likely it is that agreement morphemes will contribute exactly the same properties as are contributed by the noun. The left of the hierarchy will thus be associated with a noun-based classification of the discourse referent. Moving to the right, the more likely it is that agreement morphemes will contribute a different set of properties—either fewer properties or new properties. The right of the hierarchy will tend to be associated with a context-based classification of the discourse referent.

Conclusion

In conclusion, let me return to the four ideas presented at the beginning of the paper:

1. The agreement hierarchy presents problems for all the major grammatical theories.

Although no detailed analyses have been presented, it is clear that Corbett’s work poses serious difficulties for contemporary accounts of agreement.

2. It is not possible to divide agreement phenomena into two domains.

Several two-domain accounts have been proposed, but none of them provide a satisfactory account of the patterns of agreement found cross-linguistically.

3. The agreement hierarchy is not what it seems to be.

Corbett’s use of the term syntactic agreement refers to agreement involving feature identity. Semantic agreement is used by Corbett to refer to situations in which there is a feature mismatch between the primary and secondary sources.

4. A reasonable reformulation of the agreement hierarchy can be given in terms of a discourse-based theory of agreement.

I have introduced some basic ideas associated with Discourse-Linking Theory and provided a version of the agreement hierarchy stated in terms compatible with the theory.

Notes

1 I would like to thank Suzanne Kemmer for her comments on this paper.

2 The second problem is reconciling the agreement hierarchy, which is an implicational description at the corpus level (and perhaps within particular utterances), with the content of a grammar that is sentence-based.
The notion of two domains may be characterized differently in different theories. However, the claim made here is that all two-domain accounts will prove to be inadequate in light of the data captured by the agreement hierarchy.

Intimately connected with these issues is the distinction between agreement and anaphora. Thus linguists such as Zwicky, who perceive a major boundary between local and anaphoric domains, also tend to see a major distinction between pronouns and agreement markers. On the other hand, linguists such as Givón, C. Lehmann, and myself tend to see agreement markers and pronouns as essentially similar objects.

See Barlow (1988) for a fuller discussion.

The use of a feminine singular form in Arabic to indicate a non-human plural interpretation extends to the use of deictic pronouns. For example, the appropriate pronoun to indicate a group of chairs would be haa 'she.'

References


The Pace of Syntactic Acquisition

Derek Bickerton
University of Hawaii at Manoa

How fast does syntax develop? Traditional accounts suggest that it begins at about age one year and may not be complete until as late as age eight or nine, although by age four or five the bulk of syntax has been acquired. Reasons for proposing such an early start to the process (at a stage when the child can produce no more than single words) revolve around what Pinker (1984) called the 'continuity assumption', which regards it as more parsimonious to suppose that the child acquires syntax from the beginning with an unchanging mechanism, rather than commencing with one type of mechanism and switching to another (a claim implicit in the 'pivot' grammar of Braine 1963 and the 'maturational' claims of Borod and Wexler 1987, among others). Reasons for setting such a late date for the end of the process involve an obvious confusion between 'language' and 'a language' (see Bickerton MS). It may well take a child until nine or later to master all the finer details of English syntax, or the syntax of any other specific language. However, it can equally well be argued that the child first produces a general form of language which, if no well-formed language provides a lexicon for it, becomes the child's native language; otherwise this general variety of language is subsequently remodelled in the direction of the well-formed target model (Bickerton 1981, 1984).

Thus the process of syntactic acquisition is generally seen as occupying a period of several years. Moreover, during that period no particular variations of pace are predicted by any current theory, whether nativistic or learning-oriented. Indeed, the measures of linguistic development most commonly used directly reinforce this picture of gradual, even long-term development. The most widely used indicator is Mean Length of Utterance (MLU), a measure of development pioneered by Brown (1973) which divides the number of morphemes uttered in a given period by the number of complete utterances. For most children MLU increases smoothly and monotonically throughout the acquisition period with only minor and erratic perturbations which are easily attributable to extralinguistic factors (Brown explained the one blip on Eve's otherwise straightline graph by the fact that she had a cold on the occasion in question). There can be no doubt that MLU serves as an easily-computable figure by which children's overall progress may be readily compared. However, it has several problems as a measure of syntactic development.

In the first place it is a measure of performance, not of competence. If we want to know what are the most complex sentence structures available to a child at a given time, there is no way in which MLU can tell us. But it is competence, not performance, that we need to access in some way if we are to determine how far and how fast syntactic acquisition is progressing at any given stage. Then, quite apart from general competence-performance considerations, there are some purely pragmatic, situational factors that serve to depress MLU scores and therefore render them still less accurate as indices of syntactic attainment. Two of these will be discussed here.

First, there are in child-caregiver interaction a number of situations in which short, indeed one-word utterances are strongly favored, if not made unavoidable. One of the commonest of these is that in which the caregiver shows the child an
illustrated book containing pictures of animals. In theory it would be possible for the child to say things like 'That is a giraffe' or 'The other one is a bear'; in practice, the child says (as would many adults in similar circumstances) 'Giraffe! Bear!'

Then there is code-switching. No sooner has a child evolved out of one linguistic stage (one-word, two-word, or whatever) than that stage becomes available for code-switching. The motivation for such switching is interesting. A good diary which records the linguistic and social contexts of child utterances as well as the utterances themselves will show that frequently, when the child is tired, unwell, or frustrated in some way, (s)he will revert to utterances typical of an earlier stage of development. The motivation for this seems clear; by reverting to a more primitive form of speech, the child symbolizes a reversion to a more immature and dependent state. The subtext of one- and two-word utterances in such a context is 'I'm only a helpless baby, please look after me like you did when I was small'.

For these and similar reasons MLU cannot measure or compare levels of syntactic development attained. An alternative measure also proposed but little used in Brown (1973), longest utterance, is little better, insofar as there is no necessary connection between the length of a sentence and its complexity. Moreover, one feature of evolving syntax is the capacity to produce an ever wider variety of structures. The fact that a child can produce structures of up to six words in length does not distinguish between the child who has produced only one type of structure six words long and the child who has produced several different types of similar length.

An alternative possibility, if one harder to quantify, would be to take the most complex sentence from each week of development. The measure of complexity used here involves only the simplest and most theory-neutral assumptions: that subject predicate utterances are more complex than mere predicates, that simple sentences with two objects, or an object plus prepositional phrasae, are more complex than single-object sentences, that a sentence with two clauses is more complex than a sentence with one, and so forth. Since this requires at least a weekly record, it is a method which cannot be used on those longitudinal studies (by far the commonest nowadays) which sample the subject's speech at fortnightly, three-weekly or monthly intervals. Even studies which take weekly samples are dubious as sources, since there is no reason to suppose that the half-hour or hour that is electronically recorded in each week constitutes a valid reflection of the extent to which syntax has developed.

This is because complex sentences will not be uttered unless two conditions are met. First, the child has to have an appropriate vocabulary. For instance, factive complement clauses cannot be produced until the child has acquired verbs such as know or tell that subcategorize for such complements. Two year olds tend to know few such verbs. Second, the child must have some pragmatic motivation for using complex sentences; they will not just emerge automatically, of their own accord. Two year olds tend to have few communicative needs that require complex sentences, so initially, even when the child is obviously capable of producing them, they tend to be few in number and therefore statistically unlikely to appear in samples that may cover no more than a hundredth part of the child's waking week. It is true that the alternative method of data collection (daily noting of child utterances by a parent or other caregiver) is far from foolproof and may be biased by all kinds of irrelevant preoccupations on the diarist's part. However, there does seem to be a general bias towards recording the most 'interesting' utterances, and these are likely to include the more complex.
For this reason, two diaries were studied: that kept by Leopold (1939-49) on his daughter Hildegarde, and an unpublished diary kept by Robert Willson, then a graduate student at the University of Hawaii, on his son Seth. The results of this study are given in Tables 1 and 2 respectively.

| 1:10.0 | ride papa's neck | VERB + OBJ |
| 1:10.1 | mama wake up |
| 1:10.2 | my buggy way down |
| 1:10.3 | this my rock-baby |
| 1:11.0 | dolly ride buggy |
| 1:11.1 | where my ball | SUBJ (+ VERB) + OBJ (8 weeks) |
| 1:11.2 | papa forget this |
| 1:11.3 | watch bake cake mama (???) |
| 2:0.0* | NO DATA |
| 2:0.1 | mama bite Haiti |
| 2:0.2 | Leona put water a my hair |
| 2:0.3 | mama, scratch my back |
| 2:1.0 | NO DATA |
| 2:1.1 | I put my hat my room** |
| 2:1.2 | you watch me open sandbox*** |
| 2:1.3 | papa, you like this song? |
| 2:2.0 | you got my shoe out | SUBJ + VERB + OBJ (+ PP/OBJ2) |
| 2:2.1 | I want drink of water out my glass | (13 weeks) |
| 2:2.2 | I make cocoa all gone |
| 2:2.3 | I go at Milwaukee |
| 2:3.0 | will you hold my clock? |
| 2:3.1 | I got wehweh at my eye |
| 2:3.2 | I won't bump that |
| 2:3.3 | you go up here like I did | COMPARATIVE CLAUSE |
| 2:4.0 | I won't cry a mama wash my hair | TIME CLAUSE |
| 2:4.1 | that's the way I got my apron out | RELATIVE CLAUSE |
| 2:4.2 | mama put all my animals away because I broke them | CAUSATIVE CLAUSE |
| 2:4.3 | put this right here so I see it better | RESULT CLAUSE |
| 2:5.0 | I think I must cut this out | EMBEDDED FACTIVE |

* Hildegar's second birthday was August 3rd, 1932; diary entries for several weeks after that date are patchy due to absence of father.

**Examples for weeks 2:1.1 and 2:1.2 are both contained in an entry dated August 22nd but covering events as far back as August 11th.

***This sentence is probably formulaic: L cites only two other examples, both with watch.

Table 1: Hildegar Leopold, most complex sentences, 1:11.0 to 2:5.1
1;3.3  shit
1;4.0  night night
1;4.1  chi
1;4.2  NO DATA  
1;4.3  lalayt
1;5.0  chichi
1;5.1  'i'i
1;5.2  N ball
1;5.3  N ball
1;6.0  N tree
1;6.1  N Zack  
1;6.2  Ng Teddy
1;6.3  N trunk
1;7.0  O shower
1;7.1  a swing high
1;7.2  Ng see me
1;7.3  Ng dry
1;8.0  Ng close it
1;8.1  Thank you ball
1;8.2  N clothes on
1;8.3  N come on
1;9.0  Ride a car
1;9.1  Bounce a trampoline  
1;9.2  Turn da light  
1;9.3  Down da slide
1;10.0  Medicine a bottle
1;10.1  N jump down stairs
1;10.2  O sit ta potty seat
1;10.3  O talk a phone
1;11.0  O take a off
1;11.1  N go swimming a water
1;11.2  N push a high chair back
1;11.3  N talk a phone
2;0.0  Daddy open door
2;0.1  Daddy close da gate
2;0.2  Daddy tooting a lot
2;0.3  Help me push a play button  
2;1.0  I toldja put the flower in a vase  
2;1.1  Didja sit down tray a give me a little pudding
2;1.2  a time to go night-night and push the light
2;1.3  I want take yi nother one  

Table 2: Seth Wilson, most complex sentences, 1;3.3 to 2;1.3

The overall patterns of the tables are strikingly similar. Both children exhibit relatively slow development up to and including the appearance of single-clause sentences; then suddenly there is an explosion of longer sentences, including a wide variety of types, which takes place within the span of four or five weeks. In
both cases, this explosion takes place early in the third year; note that it involves simultaneous changes in the length, complexity and sheer variety of sentence types. (For more detailed analysis of the diary data, see Bickerton MS). The suddenness with which this developmental acceleration begins suggests that, pace adherents of the 'continuity assumption', some qualitative change in competence takes place at or shortly after the end of the second year.

However, the acceleration phase is much clearer in Seth's case than it is in Hildegarde's. Seth goes from predicate-only utterances through very primitive monoclauals to his first complex sentences in a bare month, while Hildegarde has five months of monoclauals, some of them quite complex in form (e.g. I want drink of water out my glass at 2;2.1) prior to the emergence of biclauals.

What are we to make of such differences? Are we to assume that some shift in syntactic capacity is tied to the emergence of biclauals? Or is it the case that a full syntactic capacity matures within the monoclaual period but that, for reasons yet to be determined, the appearance of biclauals is still delayed? Could the whole apparent phenomenon be one which simply dissolves when one looks at it more closely? The record in Leopold (1939-49) is not rich enough to answer these questions, while Seth's record, though rich enough, shows such rapid development that the relevant questions cannot be posed, let alone answered, on the basis of such data. To answer them, we require an adequately rich record of a child who, like Hildegarde, spent a relatively long period developing monoclaual sentences before the first clear cases of biclauals made their appearance.

Fortunately such a record became available in the unpublished diary kept during the late seventies by Richard Brislin on his daughter Cheryl as part of a larger investigation organized by Susan Braunwald. Brislin, an internationally known scholar in the field of cross-cultural relations, was primarily interested in the development of Cheryl's communicative competence rather than in syntax, but his practice of noting at least one, and often three or more, of Cheryl's utterances each day yields between 70 and 100 utterances per month, a total large enough to carry out a quantitative analysis with some degree of reliability.

Cheryl Brislin had the further advantage, from a research standpoint, of being free from factors that (it could be argued) might have affected the development of Hildegarde and Seth in ways that would make them unrepresentative of children as a whole. Hildegarde was bilingual in English and German (although, as Table 1 indicates, she was heavily English dominant during the period in question); Seth was totally blind at birth and remained heavily sight-impaired despite the achievement of some degree of peripheral vision. Bilingualism and blindness could perhaps have served in some way to sharpen their attention to linguistic form and thus led them to an earlier-than-normal development. But Cheryl Brislin was a normal, healthy monolingual. Moreover, like Hildegarde, she was one who developed monoclaual sentences over quite a long period before the emergence of biclauals (around 2;5-2;6). Prior to that period, there do emerge apparent biclaual sentences with want, but it is far from clear that want is analyzed as a full verb, rather than a modal, and there are none of the other types of biclaual that appear in Hildegarde's and Seth's developmental bursts.

Accordingly it seemed desirable to apply to Cheryl's utterances some measure(s) that, in the absence of biclauals, would indicate whether or not there was any significant change in the complexity of those utterances over the months.

---

1 I am extremely grateful to Dr. Brislin, presently of the East West Center, Hawaii, for making this diary available to me.
that preceded the emergence of biclausals. For reasons given, MLU was an inappropriate measure, but it is of interest to record the development of Cheryl's MLU if only as an object of comparison with the results of other measures.

<table>
<thead>
<tr>
<th>Age</th>
<th>MLU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1;10</td>
<td>1.77</td>
</tr>
<tr>
<td>1;11</td>
<td>1.83 + 3.4%</td>
</tr>
<tr>
<td>2;0</td>
<td>2.15 + 17.5%</td>
</tr>
<tr>
<td>2;1</td>
<td>2.63 + 22.3%</td>
</tr>
<tr>
<td>2;2</td>
<td>2.94 + 11.8%</td>
</tr>
<tr>
<td>2;3</td>
<td>2.93 - 0.03%</td>
</tr>
</tbody>
</table>

**Table 3: MLU for Cheryl, by month (plus monthly percentage gain)**

Table 3 gives MLU figures for a six-month period together with the increase in MLU from one month to the next as a percentage of the previous month's MLU. As we see, there is nothing astonishing here: Cheryl's MLU climbs quickly, more so in the middle of the period than at either end, but without any clearly marked change in pace.

However, one alternative measure would be to look at whether there is anywhere any significant increase in the number of structural types that Cheryl produces. If indeed some dramatic increment in syntactic capacity occurs early in the third year, one would predict that an initially small number of syntactic types would increase quite suddenly. For the purpose of this and indeed all the other measures described in this paper, types of syntactic structure were analyzed in the most theory-neutral way possible. Each utterance was treated simply as a combination of Noun (N), Verb (V), Adverb (Adv), Adjective (Adj), Determiner (Det), Deictic (Deic -- here, there etc.), Negative (Neg), Copula (Cop) and so on. Thus, for instance, see daddy'(s) car would be V/Poss/N, I want drink would be N/V/N, there'(s) dolly would be Deic/N, no want more would be Neg/V/Adv and so on, each being taken as a representative of a different syntactic type.

<table>
<thead>
<tr>
<th>Type inventory</th>
<th>1;10</th>
<th>1;11</th>
<th>2;0</th>
<th>2;1</th>
<th>2;1</th>
<th>2;3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-w</td>
<td>8</td>
<td>9</td>
<td>9</td>
<td>12</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>3-w</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>17</td>
<td>22</td>
<td>29</td>
</tr>
<tr>
<td>4-w</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>17</td>
<td>28</td>
<td>40</td>
</tr>
<tr>
<td>5+</td>
<td></td>
<td></td>
<td>8</td>
<td>24</td>
<td>91</td>
<td>119</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>15</td>
<td>22</td>
<td>54</td>
<td>91</td>
<td>119</td>
</tr>
<tr>
<td>Percentage Change</td>
<td>+7%</td>
<td>+47%</td>
<td>+146%</td>
<td>+69%</td>
<td>31%</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4: Cheryl's range of structural types**

The results of analyzing Cheryl's utterances in this way are given in Table 4. A basic assumption in this table is that when Cheryl has produced a form, she has mastered it, and if it does not reappear in subsequent months, this is merely an accident of the sample. The assumption is probably too strong insofar as some forms may be deliberately excluded; in other words, if a subjectless form used at 1;10 is not repeated at 2;3, this is quite likely because Cheryl has recognised that
such forms are not in English. However, totals of structures that are actually used in any month, to be found in Table 6a, surely underestimate the range of structures that Cheryl commands at any given time. Since any estimate of the structures that Cheryl may have 'discarded' in this way is unavoidably subjective, we can only assume that the number of structures commanded in any given month lies somewhere between the totals of Table 4 and Table 6a, probably lying much closer to those of Table 4 (since Cheryl's output yields very few unEnglish structures).

As will be seen from the table, the structures available to Cheryl, which change little over the first three months of the record, increase rapidly in the fourth month and continue to increase, if at a slightly slower pace, over the next two months. Equally striking are the figures based on the ratio of structural types to structural tokens. If Cheryl is undergoing some dramatic change in syntactic competence around age 2;1, one would expect to see this reflected, not only by the overall number of structural types that she produces, but also by a growing flexibility in her choice of structures. This is a more conservative measure than raw structural-type increase, since only those structural types actually occurring in each month's data.

<table>
<thead>
<tr>
<th></th>
<th>1;10;0</th>
<th></th>
<th></th>
<th>1;11;0</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-w</td>
<td>35</td>
<td>na</td>
<td>1-w</td>
<td>24</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>2-w</td>
<td>31/8</td>
<td>26%</td>
<td>2-w</td>
<td>37/8</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>3-w</td>
<td>13/4</td>
<td>31%</td>
<td>3-w</td>
<td>8/4</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>4-w</td>
<td>2/2</td>
<td>100%</td>
<td>4-w</td>
<td>2/1</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>81/14</td>
<td>17%</td>
<td>Total</td>
<td>71/13</td>
<td>18%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2;0;0</th>
<th></th>
<th></th>
<th>2;1;0</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-w</td>
<td>24</td>
<td>na</td>
<td>1-w</td>
<td>20</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>2-w</td>
<td>39/8</td>
<td>20%</td>
<td>2-w</td>
<td>24/10</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>3-w</td>
<td>12/6</td>
<td>50%</td>
<td>3-w</td>
<td>28/13</td>
<td>46%</td>
<td></td>
</tr>
<tr>
<td>4-w</td>
<td>11/5</td>
<td>45%</td>
<td>4-w</td>
<td>16/13</td>
<td>81%</td>
<td></td>
</tr>
<tr>
<td>5+</td>
<td>1/1</td>
<td>na</td>
<td>5+</td>
<td>9/8</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>87/20</td>
<td>23%</td>
<td>Total</td>
<td>97/42</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>Increase</td>
<td>+28%</td>
<td></td>
<td>Increase</td>
<td>+96%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2;0;0</th>
<th></th>
<th></th>
<th>2;3;0</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-w</td>
<td>10</td>
<td>na</td>
<td>1-w</td>
<td>13</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>2-w</td>
<td>18/12</td>
<td>66%</td>
<td>2-w</td>
<td>17/11</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>3-w</td>
<td>19/11</td>
<td>58%</td>
<td>3-w</td>
<td>32/17</td>
<td>53%</td>
<td></td>
</tr>
<tr>
<td>4-w</td>
<td>22/17</td>
<td>77%</td>
<td>4-w</td>
<td>19/15</td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>5+</td>
<td>17/17</td>
<td>100%</td>
<td>5+</td>
<td>8/7</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>86/57</td>
<td>66%</td>
<td>Total</td>
<td>89/50</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>Increase</td>
<td>+47%</td>
<td></td>
<td>Increase</td>
<td>-15%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 5: Type-token ratios for Cheryl** (by month and sentence length: 1-w = one-word utterances; 5+ = utterances of five or more words)

As will be seen, the type-token ratio, which remains below the 20% level for the first two months, barely passes it in the third month, but in the fourth month rises to 45%. In other words, at 2;1 Cheryl shifts from using a very limited number of structures over and over again to using a variety of structures which are relatively seldom repeated.
In Figure 1 (next page), we can compare these two measures -- raw type increase and type-token ratio -- with the two conventional measures of syntactic development, MLU and maximum length of sentence. The two conventional measures show a slow and relatively even increase over the six-month period; the two novel measures give a very different picture of near stasis followed by explosive growth. What is perhaps most interesting about the table, however, is a slightly more subtle relationship that exists between the two sets of measures. Over the first three months, all the measures give very similar, indeed almost identical, results: whatever the two sets are measuring in this period, it would appear to be in some sense 'the same thing'. However, the sharp divergence of the two sets at and after 2;1 strongly suggests the entrance at this point of some new factor(s) which the novel measures record but which the conventional measures do not.

<table>
<thead>
<tr>
<th>types used in previous month(s)</th>
<th>1;11</th>
<th>2;0</th>
<th>2;1</th>
<th>2;2</th>
<th>2;3</th>
</tr>
</thead>
<tbody>
<tr>
<td>new types (current month)</td>
<td>10</td>
<td>14</td>
<td>12</td>
<td>16</td>
<td>21</td>
</tr>
<tr>
<td>new types as a proportion of old</td>
<td>50%</td>
<td>44%</td>
<td>267%</td>
<td>231%</td>
<td>133%</td>
</tr>
</tbody>
</table>

**Table 6a: Rate of introduction of new structural types by Cheryl**

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1;11 and 2;0</td>
<td>.01</td>
<td>no significance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2;0 and 2;1</td>
<td>10.49</td>
<td>p = .005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2;1 and 2;2</td>
<td>.09</td>
<td>no significance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2;2 and 2;3</td>
<td>1.48</td>
<td>no significance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 6b: Chi-square comparison of Table 6a by month**

This impression is strengthened by a third measure which is shown in Table 6a. This measure is obtained by taking, for each month, the number of syntactic structures used in previous months, and comparing it with the number of novel structures produced in that month. If we divide the second figure by the first, we obtain a figure indicative of the rate at which structural innovations are introduced. It then becomes possible to compare the rate of type innovation in consecutive pairs of months by the chi-squared method; resulting probability figures are given in Table 6b. As will be seen, differences between all but one pair of months are not significant. However, the difference between months 2;0 and 2;1 is significant at a probability level of .005; that is, there is less than one chance in a thousand that the difference between these two months is attributable to chance. 2;1, of course, is the month that our other measures have already pinpointed as that in which, for Cheryl, some dramatic change in syntactic capacity took place.

Indeed, perhaps the most accurate (and certainly the most dramatic) picture of the changes taking place in Cheryl's output over this period is given if we use, for several measures, the criterion of percentage change per month. Such a measure is obviously highly sensitive to changes, more so than a mere comparison on the basis of raw figures: for example, it can reveal a quickening or a slowing of
the pace of acquisition much more clearly than raw figures can. This sensitivity is illustrated in Figure 2, which compares monthly percentage changes for four measures.

It is worthy of note that in Figure 2 (next page) all four measures show a similar pattern — even MLU, although as always this measure minimizes the extent of the changes taking place. All four measures show a peak in month 2;1 and a decline thereafter (most marked in the rate of type innovation). What this means is that while the motor of syntactic acquisition accelerates abruptly in month 2;1, it does not maintain that rate of acceleration, but rather falls back towards some kind of 'normal cruising speed'. It is hard to resist the conclusion that, at 2;1, some qualitative change took place in the child's syntactic capacity.

The change surely exists as a phenomenon in all of the only three children to be examined so far. It remains to be seen whether the same or different measures applied to the syntactic development of other children will provide similar results. If they do, then the question of explanation arises.

A simple and straightforward hypothesis is that, in the period of acceleration, the child might switch from what Gleitman (1981) termed a 'tadpole' to a 'frog' stage of development. In the 'tadpole' stage, the child would be simply putting words together like beads on a string, whereas in the 'frog' stage, the child would somehow have acquired the capacity to arrange them in hierarchical structures. The 'tadpole' phase might result from the fact that the brain mechanisms that generate syntax are not yet matured, hence the child is obliged to learn language in the same way that eating with a spoon or interacting with relatives are learned — that is, by observational and inductive learning mechanisms. The 'frog' phase would commence as soon as the appropriate brain mechanism had matured; we know that the child's brain does not complete its growth processes until age two or later, and it has been suggested that around two, events occur in and around Broca's area that might well have the result of initiating the 'frog' phase (Greenfield 1991).

For a variety of reasons, many linguists will be reluctant to accept this hypothesis. It might be argued that while the tables and figures discussed above may reveal Cheryl's productive competence, they tell us nothing whatsoever about her receptive competence. It might then be the case that she knew and understood at 1;10 many of the structures that, for some reason, she was unable to produce until 2;1 or later. It might even be the case that such passive competence was a prerequisite for the subsequent explosion of forms — a period in which she was somehow able to work out for herself the nature of syntactic structure, a problem the solution of which precipitated a cascade of novel forms.

Appealing though such a picture may seem to many, there is as yet little substance to back it. While there can be no doubt that comprehension usually goes well in advance of production, it may be able to do this only because it does not depend on explicitly syntactic knowledge. All those who have tried to learn a foreign language by the immersion method know that a great many structures are comprehensible to them which they could not themselves either produce or analyze. Semantics and pragmatics supply numberless clues to the meaning of sentences that can be exploited by their hearer. It would be difficult to devise, for two-year-olds, a test that would filter out clues of this nature, forcing an interpretation on syntactic grounds; however, some such test should undoubtedly be attempted.

There is also the question of what mechanisms would undertake such tacit learning. As noted above, there appear to be mechanisms in the brain that might automatically mediate a change from serially-ordered to hierarchically-ordered
structures. However, a mechanism that would form inductions over sets of sentences passively (but not actively) acquired prior to age two has not so far been identified, and one may legitimately doubt that it ever will be: it sounds too much like the 'general problem-solving device' beloved of behaviorists to have much credibility in terms of neurology.

Thus the data surveyed above lead one in the direction of some form of maturation theory, with a marked change in the capacity to produce syntactic structures occurring (in normals) early in the third year. Such a maturation theory, predicting as it does only a single maturation event, would be proof against the argument advanced by Ingram (1989) and others that a maturationist theory places no constraints on the number of times the nature of the child's underlying capacity may change. Since a variety of phenomena not considered in this paper point in a similar direction (see Bickerton 1990, MS for full discussion), the onus lies on those with other approaches to develop alternative explanations of the data surveyed above.

References

______ MS. Syntactic development: the brain just does it.
Locative Case vs. Locative Gender

Joan Bresnan
Stanford University and Xerox PARC

An influential idea in syntactic theory has been that category oppositions are reducible to other modules of the grammar such as Case theory and can be eliminated from the $X$ component of UG. Comparing the syntax of locatives in English and Chichewa, I will show that this is a misconception. Case, even construed quite abstractly, is a typologically parochial system that cannot replace the basic categorial opposition between NP and PP.¹

1 Locatives in English

The syntactic distribution of locative PPs in English has very complex properties which have stimulated a great deal of theorizing about Universal Grammar.

1.1 Not in Subject/Object Positions

It is well known that locative PPs in English cannot in general appear in subject or object positions, such as that of the subject immediately preceding the VP in (1a), that of the object adjacent to the V in (1b), that of the object understood as the subject of an infinitive in (1c), or that of the object of a preposition like the passive by in (1d):

(1) a. (*In) San Jose makes me happy.
   b. I like (*in) San Jose.
   c. I expect (*in) San Jose to please me.
   d. I'm pleased by (*in) San Jose.

Instead, locative PPs appear in non-subject and non-object positions. For example in (2a) the PP is an oblique complement to a verb following its NP object, and in (2b) it is a sentence adjunct:

(2) a. I left my car *(in) San Jose.
   b. *(In) San Jose, I keep my car in the garage.
1.2 Extrapolated or Topicalized

Although locative PPs do not generally appear in subject or object positions, they can be interpreted as filling those argument positions indirectly, in two ways. The first is by means of extrapolation. In (3a–c), the PP is extrapolated and is related to the subject or object positions which it cannot occupy through the intermediary pronoun it (Fillmore (1968)).

(3) a. It makes me happy in San Jose.
    b. I like it in San Jose.
    c. I expect it to please me in San Jose.

The second means of interpreting a non-NP as filling a subject or object position is by topicalization (Kaplan and Bresnan (1980/1982), Stowell (1981), Kaplan and Zaenen (1989: 33–37)). Topicalization is known to ignore certain category differences. For example, topicalized sentential that complements, which are non-nominal in English (Emonds (1976)) (though not of course in all languages), can be interpreted as filling subject or object positions which they cannot occupy directly:

(4) a. That he might be wrong, he didn’t think of __.
    b. *He didn’t think of that he might be wrong.
    Cf. He didn’t think of the fact that he might be wrong.

In the same way, the inverted PP locative in English can be indirectly interpreted as filling the subject position by topicalization (Stowell (1981), Bresnan and Kanerva (to appear), Bresnan (1990)):

(5) a. On this wall I expect __ will be hung a picture of Leonard PABBS.
    b. In San Jose __ lived a woman.

1.2.1 Subject Properties

Let us consider three pieces of evidence that the PPs in (5) are indeed related to the subject position. Further evidence is discussed in Bresnan and Kanerva (to appear) and Bresnan (1990).

Subject Extraction First, the presence of the complementizer degrades the extraction, as observed by Bresnan (1977) and Stowell (1981):

(6) On this wall I expect (*that) __ will be hung a picture of Leonard PABBS.
This degradation is of course characteristic of subject extraction in English:

(7) A picture of Leonard PABBS I expect (*that) _ will be hung on THIS wall.

The topicalization of nonsubjects, whether they are locatives as in (8a) or objects as in (8b), is not degraded by the presence of a complementizer:

(8) a. On THIS wall I expect (that) a picture of Leonard PABBS will be hung _.

b. A picture of Leonard PABBS I expect (that) they will hang _ on THIS wall.

Subject Raising Second, the inverted locative undergoes subject raising (Postal 1977):

(9) a. On this wall _ is likely to be hung a portrait of our founder.

b. On this wall I expect _ to be hung a portrait of our founder.

In both these examples the locative PP plays the role of the raised argument, the subject in (9a), the object in (9b). Because only the subject of the infinitival complement can be raised (Bresnan and Kanerva (to appear)), this is very strong evidence that the locative PP is interpreted as a subject in these examples.

Tags Third, in tag questions, an assertion is followed by a tag consisting of an auxiliary verb and a pronoun. The tag is a reduced question based on the form of the assertion, and the pronoun must match the features of the (surface syntactic) subject of the assertion:

(10) a. Mary fooled John, didn’t she/*he?

b. John was fooled by Mary, wasn’t he/*she?

In general, it is difficult to combine tags with locative inversion. However, Bowers (1976: 237) cites examples of tag questions such as (11) to argue against the subject status of the postposed NP in locative inversion.

(11) In the garden is a beautiful statue, isn’t there?

The fact that the inverted NP argument is not the antecedent for the tag pronoun here is evidence that it cannot be the syntactic subject. The hypothesis that the inverted locative is the topicalized subject would explain this situation.²

1.2.2 Topic Properties

Though they may be interpreted indirectly as subjects, there is evidence that the inverted locative PPs are not actually in the phrase structure position of the subject, but are topicalized.
Auxiliary Inversion  One piece of evidence is that auxiliary inversion with them is impossible:

(12) a. Do you remember? *Did on the wall hang a Mexican serape?
   
   b. *Was among the ruins found a skeleton?

This follows from the analysis of these inverted PPs as topicalized out of the subject position, given Falk’s (1983) analysis of auxiliary inversion (Bresnan (1990)).

Raising Asymmetries  Another piece of evidence is the word order asymmetry shown by locative PPs with subject- and object-raising verbs. Unlike NPs, inverted locative PPs cannot be raised objects, as shown in (13a), although they can be raised subjects, as shown in (13b):

(13) a. *I expect on this wall to be hung a portrait of our founder.

   b. On this wall is likely to be hung a portrait of our founder.

This asymmetry follows directly from the topicalized subject analysis. Only finite complements have a position for topicalized phrases. In (13a) the position of the PP following the verb is inconsistent with topicalization, because it precedes a nonfinite complement; in (13b) the position preceding the verb is consistent with topicalization, because it precedes the entire finite clause. The same is true in (9b), where the PP position in front of the finite clause is consistent with topicalization, while the within-clause function of the PP is that of a raised object, the same as in (13a).

Thus topicalization, like extraposition, permits locative PPs to be interpreted indirectly as filling subject or object argument positions which they cannot directly occupy.

1.3 No Subject-Verb Agreement

Even where locative PPs are interpreted as subjects, they cannot condition verb agreement. Instead, the verb agrees with the inverted NP:

(14) a. In the swamp was/*were found a child.

   b. In the swamp *was/were found two children.

In summary, locative PPs in English cannot occupy subject or object positions, although they can be indirectly interpreted as subjects or objects by extraposition or topicalization. Even when they are related to the subject argument, however, they never determine the number agreement of the verb.
1.4 A Case-Theoretic Explanation

Following Stowell (1981), it has been widely assumed that the categorial difference between NP and PP is not basic in the $\bar{X}$ component, but is derived from Case properties. Stowell argues that all of the positions which PPs can occupy in English phrase structure are positions where case is not assigned: at the periphery of the sentence in extraposed or topicalized positions, or as obliques or adjuncts, which do not receive case from the verb. NPs appear in the complementary set of environments. This difference correlates with the fact that the head of a PP is itself a Case assigner, while the head of an NP is not. Thus Stowell (1981: p. 146) proposes the Case Resistance Principle: categories that assign Case cannot receive Case. In this way a primitive categorial difference between NP and PP can be eliminated from Universal Grammar. The $\bar{X}$ component of grammar is thus category-neutral. As undifferentiated maximal projections, PPs can occupy subject or object positions as well as NPs, provided only that they move out before Case is assigned at S-structure.

There are four problems with this theory of the distribution of locative PPs. First, it provides no explanation for the contrast between (15a,b):

(15) a. In San Jose __ lives a woman.

   b. *In San Jose __ pleases me.

If topicalization in (15a) removes the PP from the subject position, where it would receive Case, why can it not do the same in (15b)? Stowell (1981: 268–9) notes this problem and makes the ad hoc proposal that reconstruction in Logical Form is obligatory for PPs, though not for sentential complements (cf. (4)). Under reconstruction, the locative PP in (15a) would appear in its original position as an oblique postverbal argument of live, where it is not assigned Case by the verb; but the PP in (15b) would appear in the subject position, where it would be assigned Case, violating the Case Resistance Principle. (This account also assumes that the Case Resistance Principle holds at Logical Form.)

The second problem with the Case Resistance theory of the distribution of locative PPs is that it provides no explanation for the verb agreement pattern in locative inversions. If the locative PP occupies the subject position, why does the verb agree with the inverted NP? This must simply be stipulated. The chain theory of inversion (Burzio (1986)), which is designed to unify the treatment of agreement and inversion, is inconsistent with the the locative being the subject, for reasons discussed by Bresnan and Kanerva (1989: 20–22).

The third problem is that the Case Resistance theory provides no explanation for the appearance of some PPs in NP positions, as in the examples in (16):

(16) a. Under the chair is a nice place for the cat to sleep.
   (Stowell (1981: ex. (27a), p. 268))

   b. He had spent from eleven to one at his church.
   (Jespersen (1927: 5ff) cited by Jaworska (1986))
c. They considered *after the holidays* to be too late for a family gathering. (Jaworska (1986: ex. (16b), 359))

Stowell (1981: 268) suggests that the contrast between (16a) and (15b) "is due to a special property of copular constructions which permits nominative case to be absorbed or deflected away from the subject position." However, Jaworska (1986) shows that the phenomenon of PPs in NP positions is not restricted to copular verbs, contrary to Stowell. She cites examples (16b,c) as evidence; in both of these examples, the locative PP is in a position where Case is assigned by a main verb which is not copular. The possibility of analyzing these PPs as dominated by an NP is not available on the Case Resistance theory of categories, because in the X component, all phrases are endocentric and PP and NP are undifferentiated as to category.

The fourth problem is that Case—even abstract Case—is a typologically parochial system. It has nothing to do with the distribution of locative phrases in the Bantu language Chichewa, for example. To illustrate this point, let us now turn to the syntactic distribution of locatives in Chichewa.

2 Locatives in Chichewa

The syntactic distribution of locatives in Chichewa differs radically from what we see in English.

2.1 In Subject/Object Positions

Locatives in Chichewa freely occur in the subject and object positions of semantically compatible verbs. Thus the Chichewa counterparts of ungrammatical English examples like (16a,b,d) are perfectly grammatical:3

   17 San Jose 17 SB-PRS HAB-1SG OB-please-IND  
   'It pleases me in San Jose, (Being in) San Jose pleases me.'

b. Ndî-ma-kónd-á ku San José.  
   1SG SB-PRS HAB-love-IND 17 San Jose  
   'I like it in San Jose.'  
   (Cf. Ndî-ma-ku-konda ku San José.)

c. Ndî-ma-sangalats-ídâ-á ndî ku San José.  
   1SG SB-PRS HAB-please-PASS-IND by 17 San Jose  
   'I'm pleased by (being in) San Jose.'

The locative phrase is a subject in (17a), an object in (17b), and the object of the preposition 'by' in (17c), which is the passivized version of (17a).

Moreover, the locative objects pass the classical locative object tests for Bantu—object marking on the verb, passivization, and word order (Hyman and Duranti
(1982)). We can see this in the possibility of the object marker in (17b). Further evidence is given in Bresnan and Mchombo (1989).

Whereas the English locative phrases can only be indirectly related to subject/object positions through extraposition and topicalization, the Chichewa locatives can directly occupy the subject/object phrase structure positions. Thus in these examples the locatives have exactly the same word order positions as ordinary, nontopicalized arguments of a verb or preposition. Bresnan and Kanerva (to appear) show that inverted locatives as well are clearly nontopicalized: subject raising of locatives in Chichewa, control of nonfinite phrases, and the interactions of locative subjects with in situ questions clearly rule out obligatory topicalization of the locative from subject position.

2.2 Noun Modifiers

Locative complements to nouns also show a difference in distribution. In arguing for the nominal status of locatives in Chishona, Myers (1987: p. 85) points out that like other NPs which (in GB terms) need Case, locative-marked nouns cannot be complements to nouns without insertion of the associative ("genitive") marker. The same is true in Chichewa:

(18) a. ku mu-dzi kw-âthu
   18 3-village 18-our
   'at our village

   2S-REC PST-arrive-IND 18 3-village 18-our
   'They arrived at our village.'

   c. *mw-aná ku mu-dzi kw-âthu
   1-child 18 3-village 18-our
   ≠ 'a child at our village'

   d. mw-aná w-á ku mu-dzi kw-âthu
   1-child 1-ASSOC 18 3-village 18-our
   'a child from our village'

As we see in (18d) an associative marker must intervene between the head noun and the locative phrase modifier. The associative marker itself has been analyzed by Myers (1987) as a preposition that allows variable gender inflection.

2.3 Subject-Verb Agreement

Most strikingly, locative subjects in Chichewa induce obligatory subject-verb agreement. This is illustrated in example (17a), where the class 17 locative verbal prefix ku- agrees with the locative noun class marker ku of the subject ku San Jose 'in San Jose'. Chichewa verbs have an obligatory subject agreement prefix
position preceding the tense/aspect prefix. Tonally, morphologically, and syntactically, the three alternative locative subject prefixes are indistinguishable from the other subject agreement prefixes of the verb. Bresnan and Kanerva (1989:29) show that exactly the same agreement properties hold for inverted locatives. There is no difference in agreement between ‘basic’ locative subjects, as in (17a), and locative subjects derived by passivization or locative inversion.

2.4 Adjuncts

While locatives in Chichewa differ from English locative PPs in appearing in subject/object positions, failing to appear as noun modifiers, and inducing subject-verb agreement, they resemble English locatives in other ways. For example, the Chichewa locatives in (19a,b) are adjuncts parallel to the English examples given in (2a,b).\(^4\)

   1SG SB-REC PST-leave-IND 9 car 9-1SG POSS 17 San Jose
   ‘I left my car in San Jose.’
   (Cf. *Ndi-na-kú-síyá gálí moto ... ’)

b. Ku San José ndí-ma-súng-á gálí moto y-ângá
   17 San Jose 1SG SB-PRS HAB-keep-IND 9 car 9-1SG POSS
   m’ garâji.
   18 5 garage
   ‘In San Jose I keep my car in the garage.’

2.5 Locative Inversion

Also as in English, locatives in Chichewa can be the oblique complements of intransitive or passive verbs and undergo locative inversion, as discussed in detail by Bresnan and Kanerva (1989):

(20) a. A-lendô-wo a-na-bwér-á ku-mu-dzi.
   2-visitor-2 those 2 SB-REC PST-come-IND 17-3-village
   ‘Those visitors came to the village.’

   17-3-village 17 SB-REC PST-come-IND 2-visitor-2 those
   ‘To the village came those visitors.’

(21) a. Mw-âna a-na-péz-édw-á kú-dâmbo.
   1-child 1 SB-REC PST-find-PASS-IND 17-5 swamp
   ‘The child was found in the swamp.’

   17-5 swamp 17 SB-REC PST-find-PASS-IND 1-child
   ‘In the swamp was found the child.’
There are extensive parallelisms between locative inversion in English and Chichewa (Bresnan (1989, 1990)).

In sum, Chichewa locatives have the syntactic distribution patterns of both NPs and PPs in English.

2.6 No Case Resistance

In English the distributional differences between subjects and objects versus adjuncts and noun modifiers corresponds to a difference in the phrase structure and categorization of constituents: only the NPs appear in subject/object positions; PPs appear in the adjunct and modifier positions. Hence it appears possible to reduce the categorial difference to the distributional difference, deriving the opposition between NP/PP from the Case Resistance Principle. But in Chichewa, as we have seen, there is no such correspondence between syntactic distribution and categorial structure. Despite the fact that Chichewa locatives have the distribution of both PPs and NPs in English, their categorial structure is completely invariant (see Bresnan and Mchombo (1989) for further evidence). There is simply no evidence for categorial ambiguity. Put in another way, Case plays no discernable role in determining either the distribution or the internal structure of locatives in Chichewa.

3 The Categorization of Locatives

How then can we explain the contrasting syntactic distribution and agreement properties of locatives in the two languages? All of the above factors point to one salient difference in the phrase structure of locatives in the two languages: in English they have the structure of PP, a nonnominal category; in Chichewa they have the structure of NP:

(22) \[
\begin{array}{c}
\text{PP} \\
\text{P} \\
in \\
\text{San Jose} \\
\end{array} \quad \begin{array}{c}
\text{NP} \\
\text{Cl} \\
ku \\
\text{San Jose} \\
\end{array}
\]

As we have seen, this basic categorial difference is not reducible to Case, though it might be reducible to other constructs such as grammatical functions (Bresnan (1982)). For example, NPs could be defined as the only categories that can occupy subject and object positions in surface structure (Bresnan (1990)). This is why the English locative phrases, not being NPs, must be extraposed or topicalized to peripheral positions in order to be interpreted as subject or object arguments in the underlying functional structure. In contrast, Chichewa locative phrases, being NPs, can directly occupy subject and object positions. Finally, the features of subject-verb agreement are inherently nominal features. Hence the Chichewa verb will show agreement with its NP subjects, including the locatives, while
the English verb can never show agreement with locative PPs. Deictic features such as proximity are distinguished in locative pronouns (*here, there*), but person, number, and gender—the universal categories of verb-argument agreement—are lacking. This is why expletive subjects derived from locative pronouns (such as existential *there*) do not determine the number of the verb:

(23) a. There are/*is infinitely many prime numbers.
    b. There is/*are one even prime number.

—while expletives derived from personal pronouns (such as *it*) do:

(24) a. It is/*are my friend that we have to consider.
    b. It is/*are my friends that we have to consider.

Like the locative pronoun *there*, locative PPs are not morphologically categorized for agreement features (though the NP object of the preposition may be). Hence, they can never determine the number of the verb.

Thus all of the differences between locatives in English and Chichewa point to a basic categorial opposition between PP and NP—one that cannot be reduced to Case properties.

### 3.1 Gender vs. Case

*Why* then are locatives NPs in Chichewa and PPs in English? I believe that this difference stems from a profound typological difference in the grammatical systems within which locatives are categorized in the two languages: case versus gender. Note that grammatical gender need not be sex-based. Gender refers to genus, and sex is but one categorization into kinds. In Chichewa, locatives are not cases, but gender classes; that is, they are part of a system that signals contrasts between grammatical categorizations of people, things, locations, qualities, and the like—kinds of things (genera), designated by NPs (Orr and Scotton (1980), Bresnan and Kanerva (1989: Appendix 1), Bresnan and Mchombo (1989)). Their nominal categorization explains the greater freedom with which locatives are distributed in Chichewa syntax. In English, in contrast, locatives are PPs, and the categorial distinction between NP and PP reflects a basic case-like opposition of direct and indirect arguments. Consequently, locatives in English are syntactically excluded from direct argument (NP) positions. This accounts for their narrower syntactic distribution compared to Chichewa, and it is the key to understanding the different agreement patterns in locative inversion in the two languages.

Gender, like person and number, is universally a category of subject-verb agreement across languages. From the categorization of locatives as genders, the possibility of locative agreement of the verb follows at once. The idea of locative genders is alien to speakers of European languages, but the evidence in support of it internal to Bantu is overwhelming. Chichewa has a system of eighteen gender classes, including classes which are associated with animates, plants, artifacts,
and their plurals (although the classes are largely formal). Each of these classes has special forms for verb agreement as well as nominal concord. For example, there are eighteen different classes of determiners, of quantifiers, of pronouns, of adjectives, and of other modifiers, as well as of subject and object prefixes to the verb. Among these eighteen gender classes are the three locative classes. Europeans often think of genders as partitioning the set of noun stems of a language into mutually exclusive classes; in Chichewa, in contrast, only a few noun stems are inherently locative in class, and virtually any noun can take a locative class marker, creating a shift in meaning. This use of gender can be compared to sex gender in some European languages, which is much less productive, but still available for semantic shifts, as in Italian ragazzo ‘boy’, ragazza ‘girl’. The appearance of the locative gender markers outside an inner class prefix is not exceptional; other Bantu gender class prefixes such as diminutive and augmentative share this property (Bresnan and Mchombo (1989)).

In sum, locatives are grammatically categorized as genders in Chichewa. Gender is a system for distinguishing kinds of things, designated by NPs, and is a universal category of verb agreement.

In contrast to gender, indirect or oblique case is very generally incompatible with verb agreement: in languages which permit indirect case subjects, the verb ceases to agree with the subject; it either assumes an invariant form or agrees with the highest-ranking direct case argument in the argument structure, which may be a nominative object, as in Icelandic (Thráinsson (1979), Andrews (1982), Zaenen, Maling, and Thráinsson (1985)) and Hindi (Mohanan (1990)). Thus the analysis of the English locative PP as an indirect argument provides some insight into the pattern of agreement of the verb that appears with locative inversion in (25a): the verb cannot agree with the locative subject, which is an indirect argument, so it agrees with the theme object, which is the highest-ranking direct argument in the argument structure (Bresnan and Kanerva (1989), Bresnan (1990)).

The indirect case analysis also explains further facts that the Case Resistance theory failed to account for. In (25a) the PP cannot appear in the subject NP position, but can be interpreted as the subject through topicalization. Why doesn’t the same mechanism work in (25b)?

(25) a. In San Jose _ lives a woman.

   b. *In San Jose _ pleases me.

The solution is evident from our present perspective. Indirect case arguments are universally associated with specific semantic roles. Indeed, the oblique cases of traditional grammar are named by semantic role: “instrumental,” “ablative,” “locative,” and the like. English verbs that take locative arguments lexically associate indirect case with their locative (PP) roles and direct case with other (NP) roles. In this way the verb lives in (25a) differs crucially from the verb pleases in (25b): lives has a locative role in its semantic argument structure; pleases does not. As used in (25a), the verb live does not mean merely to exhibit the characteristic signs of life, but to inhabit or occupy a place in the world, to reside
somewhere. In this use, living is construed as a relation between an individual and a place. Pleasing is also a two-place relation, but neither of its two roles is locative. Assuming that indirect case is lexically associated with locative roles, lives can take an indirect case (PP) argument; pleases lacks such a role and takes only direct arguments. It then follows that the PP as an indirect argument cannot be related by topicalization to direct arguments without producing an inconsistency of case attributes. (Following Kaplan and Zaenen (1989) and Bresnan (1990), I am assuming that topicalization identifies the topic with the grammatical function of the gap at the level of functional structure, where case government is also defined.)

Finally, I note that further support for this hypothesis comes from considering the properties of those PPs in English that do appear in NP positions:

(26) a. *Under the chair is a nice place for the cat to sleep.
   (Stowell (1981: ex. (27a), p. 268))

b. He had spent from eleven to one at his church.
   (Jespersen (1927: 5ff) cited by Jaworska (1986))

c. They considered after the holidays to be too late for a family gathering. (Jaworska (1986: ex. (16b), 359))

Unlike the inverted locative PPs, these PPs can appear in object positions, as in (26b,c), allow subject auxiliary inversion, as in (27a), and permit tag-formation with a personal pronoun, as in (27b,c):

(27) a. Is under the bed a good place to hide?

   b. Under the bed is a good place to hide, isn’t it?

   c. Between six and seven suits her fine, doesn’t it?

Moreover, these examples allow plural verb agreement when they are conjoined in subject position, in contrast to inverted locative PPs:

(28) a. Under the bed and in the closet are good places to hide.

   b. *In San Jose and in Los Angeles live a woman.

In all these respects these examples behave like nominal phrases, not PPs. The simplest analysis is simply that they are place or time NPs whose missing nominal heads are pragmatically interpreted as instances of ellipsis:

(29) [NP (a place) [PP under the bed]],
    [NP (a time) [PP between six and seven]].
This analysis can also explain why these examples have an elliptical flavor and are best in contexts in which the semantics require or the context presupposes a place or time argument. For example, (26a) explicitly predicates being a place of the subject; in (26b) the verb *spend* implies a temporal object; in (26c), the predicate complement also implies a temporal object. If we substitute these same PPs into our original examples (1a–c), where the semantics do not impose a temporal or locative interpretation on the subject or object, the results are much worse:

(30) a. ??Under the chair makes me happy.
    b. ??I like from eleven to one.
    c. ??I expect after the holidays to please me.
    d. *I'm pleased by under the bed.

Finally, this analysis can explain the following type of contrast, due to Kaisse (1985: p. 40).

(31) a. Under the bed /z/ a great place to hide.
    b. In San Jose */z/ a great restaurant.

As Kaisse observes, voicing assimilation of the reduced form of *is* is possible when the pre-clitic phrase occupies the subject position, but not when it appears in the fronted position of topics or interrogatives.8

We find, then, that these PPs that can occupy NP positions show the complete cluster of properties lacking in the locative PPs considered earlier: they occupy object as well as subject positions, need not be topicalized, and they allow subject-auxiliary inversion, tag questions with personal rather than locative pronouns, and subject-verb agreement. The fact that the agreement property coincides with the NP-distributional properties strongly supports the analysis proposed here. Locatives are PPs in English, NPs in Chichewa. The structural opposition between NP and PP in English is tied to an abstract case-like opposition between direct and indirect arguments, and this explains the restricted distributional and agreement patterns of locatives in this language. But the NP/PP opposition is not tied to Case in Chichewa. The radically different distributional and agreement patterns we see in Chichewa follow from the categorization of locatives as gender classes in that language.

4 Conclusion

In conclusion, we have seen that English and Chichewa differ typologically in the categorization of locatives as genders, expressed as NPs, or as indirect cases, expressed as PPs. These results suggest that it may be a mistake to represent the
underlying levels of grammar universally in terms which, like Case government, appear to be typologically parochial.

Africanists have often commented on the tendency to impose European categories of grammar inappropriately on African languages (e.g., Welmers (1973), Clements (to appear), Mufwene (1989), Bresnan and Moshi (1990)). Although it may be an unavoidable and even useful human tendency to categorize the unknown in terms of the familiar, this tendency is not harmless in the context of the universalist conception of generative grammar. It can lead to a kind of intellectual colonization of languages under the banner of Universal Grammar—and to the consequent impoverishment of our understanding of the nature of language and mind.

5 Notes

1This study is based upon work supported in part by the United States National Science Foundation under Grant No. BNS-8919880, Stanford University.

2For detailed discussion of alternative analyses, see Bresnan (1990).

3I have found no object-raising verbs in Chichewa corresponding to (16c).

4Note that the locatives in these examples do not have object properties, as indicated by the impossibility of the object marker in (19a).

5The converse is not true: nonsubject and nonobject positions can be occupied by NPs, as is the adverbial position in We work every day.

6As noted above, a subclass of these verbs, including enter, cross, pass, take NP (direct) locative arguments.

7I am grateful to Janet Fodor for bringing this observation to my attention.

8Thanks to Carlos Gussenhoven for these examples.

6 References


Bresnan, J. (1990) "Levels of Representation in Locative Inversion," invited address presented at the 13th GLOW Colloquium at St. John's College, Cambridge University, on April 6, 1990; revised and duplicated, Department of Linguistics, Stanford University, California.


Voicing is not Relevant for Sonority

Young-mee Yu Cho
Stanford University

0. Ranking segments with respect to sonority is clearly needed for syllabification (Jespersen 1904, Hooper 1976, Venneman 1984, Steriade 1982, Clements 1987), and a typical hierarchy has been (1) vowels > glides > liquids > nasals > obstruents.

In addition to the features that would characterize the above segments, it has often been proposed that voicing and continuancy also play a role in the hierarchy. (2) gives Jespersen’s version of the sonority scale, in which both voicing and continuancy are relevant in defining sonority.

(2) Jespersen’s (1904) sonority scale
voiceless stops/voiceless fricatives
voiced stops
voiced fricatives
nasals/laterals
voiced r-sounds

I will argue in this paper that continuancy, but not voice, can be relevant on a language-particular basis for computing sonority. Although it is not relevant here to discuss whether the universal sonority ranking should be derived from the major class features or assumed to be a primitive entity in the grammar, I will follow Clements (1987) and Zec (1988) in assuming that the sonority scale should be defined in terms of independently motivated binary features.

1. Whereas it has been agreed that the sonority scale given in (1) is valid universally, there have been several approaches with respect to the two features [continuant] and [voice], as summarized in (3).

(3) place for [voice] and [continuant] in sonority
a. voiced obstruents > voiceless obstruents (Basboll 1974)
b. fricatives > stops (Zec 1988)
c. either a or b on a language-particular basis (Steriade 1982, Selkirk 1984, Levin 1985, Clements 1987)

Basboll (1974, 1988), for instance, argues that voicing is part of the universal hierarchy but the distinction between fricatives and stops is not, mainly on the basis of the fact that /s/ can occur at the margin of the syllable, separated from the nucleus by a stop whereas a voiced obstruent cannot occur outside of a voiceless obstruent. His analysis is based on Danish, in which voiceless stops occur outside of voiced fricatives, as illustrated by the data in (4). In
addition, /s/ + stop clusters such as /sk/ and /st/ are allowed, as is the case in many other Indo-European languages.

(4) Danish (Basbøll 1974)

\[\text{skvulp, tvoerg, skoelmßk}\]

Given the analysis of /s/ as a heterosyllabic (or extrasyllabic) segment, which is well motivated in such languages as Sanskrit, Latin and Greek (Steriade 1982), there is no reason to assume that voicing is relevant for sonority in Danish. Quite the contrary, such coda clusters as /-lmsk/ (which is listed in (4a)) illustrate that the continuant /s/ should be found closer to the nucleus than the non-continuant /k/, thus arguing for the relevance of the feature [continuant]. An additional argument for excluding the feature [voice] from the sonority scale is based on the commonly-held observation that voicing cannot be interrupted within the syllable. In the next section, I will argue that the voicing constraint within the syllable is due to a universal rule which is independent of syllabification.

On the other hand, Zec (1988) proposes a constrained theory of sonority in which only the features Consonantal, Sonorant, and Approximant are needed universally for sonority distinctions. In addition to the universally needed features, the only relevant features are the so-called stricture features such as Continuant and Glottalized, which can be selected on a language-particular basis. She excludes [voice] from the set of sonority features mainly on the grounds that the use of both of the features [continuant] and [voice] creates inter-language conflicts in sonority ranking, resulting in a situation (as shown in (5)) in which /s, z/ are more sonorous than /t, d/ in one language while /d, z/ are more sonorous than /t, s/ in another language.

(5) Sonority Conflicts (Zec 1988)

Language A (the feature [continuant] is chosen for sonority)

- \(t, d\) are less sonorous than \(s, z\).

Language B (the feature [voice] is chosen for sonority)

- \(t, s\) are less sonorous than \(d, z\).

She argues that language-specific modifications cannot create a situation in which one segment, \(a\), is more sonorous than the other segment, \(b\), in one language and \(b\) is more sonorous than \(a\) in another language. In order to have language-specific modifications constrained properly and not to allow such conflicts, Zec eliminates [voice] from the sonority scale.

Yet another approach is represented by Steriade (1982), Selkirk (1984) and Levin (1985), who take the position that either of the features can be chosen on a language-particular basis. Similarly, Clements (1987) assumes that languages may include the features [continuant] and/or [voice] in their definition of the sonority scale as a marked option.
This paper presents several arguments for the position taken by Zec that [voice] is not part of the sonority hierarchy in any language. I will examine all the putative cases known to me in which [voice] plays a role in the sonority scale, and conclude that these cases should be reanalyzed either as involving Universal Devoicing or as illustrating OCP-based negative constraints.

3. The main justification for including [voice] has been the fact that in some languages voiced obstruents are located closer to the syllable nucleus than voiceless obstruents (Greenberg 1978). Thus voiced obstruents would rank higher in sonority than voiceless obstruents. This line of argument suffers from the misconception that all the sequencing constraints within the syllable can be characterized by sonority. However, it has been observed by many (Kiparsky 1979, Clements and Keyser 1983, Clements 1987, Zec 1988) that not all sequencing constraints in syllabification are due to sonority. Syllabification is governed not only by sonority but also by various other constraints. I propose that the constraint governing the position of voicing within the syllable is not due to sonority but to a universal rule of devoicing.

Greenberg, after investigating 104 languages, arrives at the conclusion that voicing agreement in syllable internal obstruent clusters is a strong tendency but there are exceptions. The exceptions are of the type in which voicing is found closer to the nucleus.¹ For example, there are a few languages which allow an initial unvoiced + voiced sequence and a final voiced + unvoiced sequence, as shown in (6).

(6) Examples of tautosyllabic Voicing disagreement

   English (svelt/, midst), Swedish (to:gs)
   Coeur d’alene (/tgʷ-/ /stgʷ-/), (/gʷt/, /gʷts/)
   Palaychi Karen (/sz-/ /fv-/ /kj-/
   Gilyak (/vf/)

The clusters shown in (6) are well-formed since the consonant with the feature [voice] is found closer to the nucleus than that without the [voice] specification.

In an earlier paper (Cho 1990a), I proposed the Universal Tautosyllabic Voicing Constraint which is based on the observations of Greenberg (1978) and Harms (1973) that in cases of voicing disagreement voiced obstruents are always located closer to the syllable nucleus than voiceless obstruents (which I call Universal Tautosyllabic Voicing Constraint (UTVC).

Universal Devoicing is formulated in (7).
(7) Universal Devoicing

\[
\sigma [c \quad c \\
\hat{+} \quad [-\text{son}] \\
[\text{voice}] \\
--------------------------> \\
\text{syllable nucleus}
\]

In this account, the reason why some languages allow onset clusters of the form "[voice] [+voice]" but not of the form "[+voice] [−voice]" is not that voiced consonants are more sonorous than voiceless consonants, but that the latter structure is ill-formed universally.

I will very briefly illustrate how Universal Devoicing works by using the data in English and Swedish.

(8) English Voicing Assimilation (Halle and Mohanan 1985, Mascaró 1987)

a. Level 1 Voicing Alternation

leave−left  five−fifth−fifty
lose−lost−loss  life−lives−lively
cloth−cloth−clothing
dialectal variations: width, breadth, hundredth

b. Tautosyllabic clusters that do not agree in voicing: svelte, midst

c. Voicing Alternation in Inflection

fans [z] laps [s]
Jay's [z] Dick's [s]
he's [z] that's [s]
tied [d] kissed [t]
phoned [d] talked [t]

d. Post-lexical Voicing Alternation

Bob's [z] a fool/ Pat's [s] a fool.

First, there is a devoicing effect in level 1 as shown in (8a); for some forms devoicing is obligatory (fifth) while other forms exhibit dialectal variations (width). Following Mascaró, I will assume that the voicing agreement in level 1 between the stem-final consonant and the voiceless suffix is essentially different from that of the regular inflection and postlexical voicing. For one thing, while some suffixes obligatorily trigger voicing agreement (fifth, left, cleft, lost), others do so only in certain dialects (Kenyon and Knott 1953, Hayes 1986) as shown in such forms as width, breadth, hundredth. If the voicing agreement were accomplished by a language-specific rule that ensures voicing agreement in tautosyllabic clusters, as has been formulated by Halle and Mohanan (1985),
these forms, together with the words in (8b) would remain exceptions to the rule. In *fifth*, the underlying *v* gets devoiced when the suffix *-th* is attached, whereas the *d* in the *hundredth* is not affected by the rule.

Assuming that the level 1 devoicing is a morphologically governed devoicing rather than triggered by voicelessness assimilation, I have also accounted for the cases in (8c,d) not by assimilation but by devoicing; this time, not morphologically governed but governed by a Universal Delinking rule. Among several ways of handling the dependence of the voicing of the suffixal obstruent on the voicing of the preceding segment, I have assumed that the suffixal consonant has an underlying voice specification and the specification is delinked due to a universal rule. When a voiced suffix is added to a stem that ends in a voiceless consonant, the sequence (e.g. *that*-z, *lap*-z) creates a violation of the Universal Tautosyllabic Voicing Constraint. UTVC will not affect such English clusters as *svelte, midst, width* but it will apply to the English inflectional endings. Voicing reversals in final obstruent clusters in such words as */lap+z/, */kis+d/ and */pat+z/* are not permitted by the UTVC and the [voice] specification has to be delinked from the suffix.

Swedish can be analyzed in the same way as English.

(10) Swedish Devoicing (Lyttkens and Wulff 1885, Hellberg 1974)

a. Level 1 Devoicing

   ha: v ‘sea’ -s ‘adverbial suffix’ [hafs]
   ti:d ‘time’ -s [tits]
   hō:g + ti:d → [hōktid] ‘festival’
   da:g + s + ljus → [daksljus] ‘daylight’

b. Later level

   ha: v + s (Gen.) → [ha:y]
   to: g + s (Passive) → [to:y]

It should be noted that voicing (and tensing) agreement is obligatory only in morphologically governed contexts as shown in (10a) (before the adverbial suffix */-s/), in established compounds as well as before the nominalizer */-sel/). For instance, the adverbial suffix */-s/ triggers devoicing whereas the genitive */-s/ does not trigger full devoicing. Later devoicing in clusters is not categorical in nature and is a purely phonetic effect. The Universal Delinking triggered by the UTVC does not play a role in the above data since the output of the later level morphology conforms to the UTVC as shown in examples like *ha:y*, *to:y*.

Just as in English, a different pattern emerges when a voiced suffix is added to a stem.²

(11) Affixation of voiced suffixes

   köp + d → köpt ‘buy’ (past participle)
   köp + t → köpt ‘buy’ (supine)
bygg + d → byggd 'build' (past participle)
bygg + t → byggt 'build' (supine)

In the first example in (11), the voiced suffix /-d/ (past participle) does not survive the UTVC since it is preceded by a voiceless consonant which is closer to the syllable nucleus. On the other hand, when it is preceded by a voiced consonant, there is no reason why it should be delinked. This is in direct constrast to the behavior of the voiceless suffix /-t/ (supine) which triggers only partial (i.e. phonetic) devoicing like other voiceless suffixes.

Traditional accounts have proposed a mirror-image rule that assimilates a voiced obstruent to a voiceless obstruent without regard to the temporal order, much like Halle and Mohanan's (1985) account for English. These accounts find it extremely difficult to explain the different behavior of devoicing effects; categorical in the earlier level and gradient in the later level. In contrast, the present analysis of Swedish devoicing based on Universal Delinking provides a natural explanation for the asymmetrical behavior of voiced and voiceless suffixes.

At this point, it should be noted that there is a crucial difference between Universal Devoicing which governs the tautosyllabic obstruent clusters, and the sonority scale, which also governs sequencing of consonants within a syllable. Several arguments can be put forward for the independence of UTVC from sonority. First, violations of UTVC are always repaired by delinking [+voice] rather than by the usual mechanisms for dealing with unsyllifiable segments, such as epenthesis or cluster simplification. This clearly shows that the constraint on the sequential ordering of voice within the syllable is independent of sonority. Also, there seem to be no rules delinking features when sonority violations are involved; i.e., there seem to be no rules that change stops into fricatives, fricatives into nasals, etc. when syllabification fails. On the other hand, violations of the Tautosyllabic Voicing Constraint do not result in stray consonants. Rather, sequences of voiced and voiceless clusters in the onset have to be syllabified first in order to undergo devoicing, whereas a consonant left stray after syllabification is subject to epenthesis or deletion. If [voice] is one of the features defining sonority in a language, a voiced obstruent located outside of a voiceless obstruent should remain unsyllifiable and it should be able to undergo epenthesis or stray erasure.

4. Facts of minimal distance have also been used as an additional argument for including [voice] for computing sonority (Hooper 1976, Selkirk 1984, Steriade 1982, Clements 1987). Often, it has been tacitly assumed that all tautosyllabic clusters should be characterized in terms of sonority ranking; the reason why blikc is well-formed but bnick is not has been attributed to the fact that /b/ and /n/ are not distant enough in a finer-grained sonority scale. Following proposals by Kiparsky (1979) and Zec (1988), I will present
an OCP-based account of minimal dissimilarity, which is independent of sonority sequencing. For instance, the *bnick/blick fact is better accounted for by a constraint on stop sequences, as shown in (12).

(12) *bnick blick

* [−cont][−cont] (Kiparsky 1979)

It is noted by many linguists (Harris 1983, Clements and Keyser 1983) that negative syllable structure conditions (or filters) are necessary independently of sonority. This can be best illustrated by Spanish, as discussed by Harris. In some dialects of Spanish, [tl, tr, dr] are permissible onsets, but not [dl], as shown in (13a). Harris proposes the filters in (13b).

(13) a. Spanish Onsets (Harris 1983)

\[
\begin{align*}
\text{pr} & \quad \text{tr} & \quad \check{\text{cr}} \\
\text{pl} & \quad (\text{tl}) & \quad \check{\text{cl}} \\
\text{br} & \quad \text{dr} & \quad \check{s}r \\
\text{bl} & \quad \check{d}l & \quad \check{s}l \\
\text{fr} & \\
\text{fl} & \\
\end{align*}
\]

b. Negative filters

\[
\begin{align*}
\text{tr/} & \quad \text{dr/} & \quad \text{tl/} & \quad \check{d}l \\
\text{tr/} & \quad \text{dr/} & \quad \text{t}l & \quad \check{d}l \\
\text{tr/} & \quad \check{c}r & \quad \check{s}r
\end{align*}
\]

The ill-formed sequences in the third column have been attributed to the negative condition on the sequences of homorganic consonants; i.e., /t/ and /d/ are dentals whereas /r, l, s, ´c/ are alveolars. Only those clusters whose members differ in place are permissible, as the filter indicates. The use of filters as dissimilarity requirements is needed in many languages which do not allow sequences like [pf], [yi], [wu], [pw], or [tl]. (14) gives some examples of language particular OCP conditions.

(14) Language-Particular OCP Conditions on Tautosyllabic Sequences

a. * [+labial] [+labial] (English *pw, *bw, *fw)

b. * [+round] [+round] (Korean *wo, *wu)

c. * [+back] [+back] (Ignaciano Moxo *yi)

Constraints on tautosyllabic sequences of 'similar' segments can be derived in a principled manner by fine-tuning the Obligatory Contour Principle (McCarthy 1986). According to the present account, any feature including the place features and [voice] can be selected to form language-specific syllable structure constraints.
The fact that negative filters are independent of sonority is illustrated in English where /sl/ is a possible onset whereas /sr/ is not, which should be stipulated as a language-particular idiosyncrasy. An account utilizing minimal sonority distance will fail because the distance between /s/ and /r/ is greater than that between /s/ and /l/, thus falsely predicting that /sr/ is the preferred onset.

Following the arguments proposed by Clements and Zec against Steriade's (1982) 'increasing sonority' constraint that requires some language-specific magnitude of difference between successive segments in onsets, I take (15) to be the universally valid sonority hierarchy, in which neither place features nor voicing play any role.

(15) Universally Valid Sonority Hierarchy (Clements 1987, Zec 1988)
Stops < (Fricatives) < Nasals < Laterals

Steriade (1982) includes the feature Voicing in the sonority scale of Greek, and the feature Coronal in that of Latin. Eliminating these features from sonority is well-motivated; various sonority scales proposed in the literature (Steriade 1982, Selkirk 1984, Levin 1985) are not restrictive enough to allow many instances of inter-language conflict, and involve too many redundancies. In addition, even with language-specific sonority scales and intervals, it is not possible to get rid of idiosyncratic negative conditions.

Steriade proposed the sonority scale in (16) for Greek.

(16) Greek Sonority Scale (Steriade 1982)
[-son, -cont, -voice]: p, t, k
[-son, -cont, +voice]: b, d, g
[-son, +cont, -voice]: s
[-son, +cont, +voice]: z
[+son, -cont, +nas]: m, n
[+son, -cont, -nas, +lat]: l
[+son, -cont, -nas, -lat]: r

The minimum sonority difference for Greek is 4 intervals.

The above scale together with the minimum distance of 4 intervals was proposed to account for the purported fact that voiced stops are more sonorous than voiceless stops, thus allowing sequences of voiced stop + liquid but not voiced stop + nasal, as shown in (17).5

(17) Greek Onsets according to Steriade
pn, tn, kn, pl, tl, kl, pr, tr, kr
bl, gl, br, dr, gr but *gn

However, a closer inspection of the data reveals otherwise. First, according
to Steriade, the clusters subject to Attic Shortening (correptio Attica), leave the preceding syllable as a light syllable whereas all other consonant clusters turn a preceding short vowel into a metrically heavy syllable. Failure of Attic Shortening, then, is an indication that the cluster in question is heterosyllabic. The tautosyllabic assignment of intervocalic clusters is obligatory only in clusters consisting of a voiceless stop followed by a sonorant, or a voiced stop followed by /r/, as shown by (18). Crucially, however, /gl/, which is a well-formed onset according to the scale in (16), patterns with such heterosyllabic clusters as /sk/ and /sp/.

   kr, gr, kl, kn, km, pr, pl, tr, dr, tl, tn
b. Failure of Attic Shortening
   gl, gm, pt, ks, sk, spl

The perfect reduplication again manifests the same patterning; i.e., only voiceless stop + sonorant and voiced stop + r clusters are treated as tautosyllabic. As listed in (19), the initial stops in /bl/ and /gl/ fail to be reduplicated in the same manner as /sp, pt, kt/ and /gn/.

(19) a. Perfect Reduplication
   krag                ke-kraga ‘to cry’
   tlā                 te-tlamai ‘to hit’
   pneu                pe-pneuka ‘to breathe’
   drā                 de-drāka ‘to pull’

b. Heterosyllabic clusters
   sper                e-spermai ‘to sow’
   ptai                e-ptaika ‘to stumble’
   gnō                 e-gnōka ‘to know’
   gluph               e-glupha ‘to sculpt’

There is a clear distinction between voiceless and voiced stops in Greek in their ability to form onset clusters, but the distinction is not one that can be characterized by manipulating the sonority scale in (16) in any way, since the minimum sonority difference of 4 intervals guarantees both voiceless stop + /l/ and voiced stop + /l/ to be well-formed onset clusters. There is no reason why there is a difference between /gl/ and /bl/ on the one hand and /gr, dr/ and /br/ on the other. Instead, I propose the syllable template in (20a) and the negative condition in (20b) in order to syllabify /gn/ and /gl/ as heterosyllabic but /gr/ as tautosyllabic.

(20) a. Greek Syllable Template
   [−son, −cont] [−son]
b. Negative condition

\[ [+\text{voice}] [+\text{voice}][-\text{cont}][-\text{cont}] \]

The negative condition in (20b) is based on the OCP-based dissimilarity requirement as in the Spanish filters. While it is clear that nasals are characterized as \([-\text{continuant}]\), we need independent evidence that /l/ is \([-\text{continuant}]\) (SPE and Tatò (1981)). For instance, as shown by the examples in (21), in nearly all dialects of Spanish the labial and velar voiced obstruents appear as continuant [b] and [g] after [l] whereas the dental stop is realized as the stop [d] in the same environment. Mascaró (1982) accounted for this by assigning either \([+\text{continuant}]\) or \([-\text{continuant}]\) to [l], depending on the place of articulation of the following segment. In other words, [l] counts as \([+\text{continuant}]\) before labials and velars but as \([-\text{continuant}]\) before dentals.

(21) Spanish Spirantization (Mascaró 1982)
ca[lb]o, ga[lg]o, but ca[l]d]o

If we allow the continuancy specification of the lateral to vary between languages (or even within the same language) or if we follow Mohanan’s (1989) proposal for an additional feature [stop], the negative condition in (20b) might not be as ad-hoc as it first appears. Whatever the right formulation of the Greek constraints might be, it is clear that the feature Voice cannot be employed to account for sonority sequencing.

5. In conclusion, the fact that [voice] is sometimes needed to account for syllable structure constraints does not stem from sonority considerations but from two independent factors; one, Universal Tautosyllabic Devoicing and the other, OCP-based dissimilarity requirements, for which voicing is in no special relation with the features defining sonority.

Notes

* I would like to express my thanks to S. Inkelas, P. Kiparsky, W. Leben, E. Bratt, W. Poser, and D. Zec for many valuable comments.

[1] 10 percent of the initial systems contain unvoiced + voiced sequences, and 7 percent of the final systems contain voiced + unvoiced sequences. On the other hand, there is less than 1 percent initial voiced + unvoiced (mostly nasal+ voiceless obstruent) and around 2 percent of final unvoiced + voiced (mostly obstruent + nasal). It can be shown that there is no single case that violates this generalization.

[2] Unlike English, there is some evidence for assuming some suffixes to be underlyingly voiced. When a vowel intervenes between the stem-final consonant and a suffix, some suffixes surface as voiced (as in *kalla + d → kallad*
'call (Past Participle)') and other suffixes surface as voiceless (as in *kalla + t → kallat 'call (Supine)').


[4] Adjunction to the edges seems to be an additional mechanism for unsyllabifiable segments, as in the cases of /s/ in the /s/ + stop clusters in Sanskrit, Greek, etc., and English coronal codas. It needs further research to determine whether feature-deletion is involved in unsyllabifiable segments. Many coda rules involve feature-addition as in Japanese and Hausa.

[5] The scale in (16) also allows /sr/, which is not attested in the language.

References


The Discourse Functions of Relative Clauses in Indonesian

Michael C. Ewing
University of California, Santa Barbara

1. Introduction

In the languages of the world, relativization can occur with nouns serving a variety of grammatical roles both within the relative clause and in the main clause. Recent research indicates that the different possible configurations of relative clauses do not occur with equal frequency in discourse (Fox 1987, Fox and Thompson 1990, Collier-Sanuki 1991). Rather, the functions of relative clauses appear to influence speakers’ preferences for certain of these grammatical configurations. As a language that makes extensive use of relativization, Indonesian is particularly useful for investigating the functions of relative clauses in naturally occurring discourse. By examining the relative clauses in a number of Indonesian texts I hope to show that even across a variety of possible grammatical configurations, relative clauses are employed to accomplish the same basic set of discourse functions.

1.1. The Form of Relative Clauses in Indonesian. The structure of a typical Indonesian relative clause is illustrated in (1).

(1) lampu stop [yang menyala merah]
lamp stop REL shine red
‘a stop light [that was red]’ (28.13)²

The relative clause follows the head noun and is marked by the particle yang. In this and all following examples the head noun is underlined and the relative clause bracketed in both the Indonesian and the free English translation.

In Indonesian, relative clauses can be formed on both direct and oblique arguments. When direct arguments are relativized, no overt occurrence of the relativized noun phrase appears within the relative clause, as is illustrated in (1). I will refer to direct arguments using the labels A, S, and P, taken from Comrie (1978). A represents the most agent-like argument of a transitive clause. S represents the single argument of an intransitive clause. P represents the most patient-like argument of a transitive clause. Examples of relativization on each of these arguments are given in (2) through (4). In this paper I will use the term A-Relative to refer to a relative clause relativized on the A argument within it, S-Relative to refer to relativization on S within the relative clause, and P-Relative for relativization on the P argument.

(2) A-Relative:
Suhanda dan dua kawannya [yang segera menawarkan burung]
Suhanda and two friend.3POS REL quickly offer bird
langka itu] rare that
'Suhanda and two of his friends [who quickly offered (for sale) one of those rare birds]' (47.9)

(3) S-Relative:
   pemuda bertatto [yang ketakutan hingga nekat] youth with.tattoo REL afraid until willing.to.take.risk
   'youths with tattoos [who were so afraid they would do anything]' (16.20)

(4) P-Relative:
   tanah [yang didiami Mbok Surip] itu land REL PASS.occupy Mrs. Surip that
   'the land [that Mrs. Surip occupied]' (24.11)

When oblique arguments are relativized, a pronoun trace, usually the third person enclitic -nya, appears in the relative clause, as in (5). In the present paper, however, I will confine discussion to relativization on direct arguments only.

(5) tradisi hukuman [yang tak jelas nilai edukatif-nya] ini. tradition punishment REL not clear value educational-3POS this
   'This tradition of punishment [whose educational value is not clear].' (29.10)

One of the interesting characteristics of relative clauses is that the argument on which the relative is formed actually serves two grammatical roles. Up to now I have discussed the role of this argument within the relative clause. This same argument also serves another grammatical role in the main clause. This is illustrated by example (6).

(6) Yang membawa senapan menembaki ikan [yang sekarat]. REL carry rifle shoot fish REL in.agony
   'Those who had rifles shot the fish [that were in agony].' (42.5)

Here ikan 'fish' acts as the S of the predication sekarat 'be in agony' within the relative clause, but in the main clause this same noun phrase is the P of the verb menembaki 'to shoot'. Because of this dual nature, I will refer to the relativized noun phrase as the Shared Nominal. In my data, Shared Nominals play a wide range of roles in their main clauses. In this paper, I will discuss only those relative clauses (formed on direct arguments within the relative clause) modifying Shared Nominals that are direct arguments in the main clause.

1.2. The Data Base. The data for the present study are from a collection of 92 short articles, mostly of a human interest nature, from the weekly news magazine Tempo and reprinted in Setiawan (1987). Of the 347 relative clauses in my data, sixteen have Shared Nominals that serve as oblique arguments within the relative clause. These are not considered here. 116 other relative clauses have Shared Nominals that serve as oblique arguments
in the main clause. These are also not included in this study. This brings the total number of relative clauses in my data base to 215.

1.3. Information flow. Interactional aspects of discourse, also called information flow, can affect the choices speakers make among various types of relative clauses and can help to explain the motivation for their use. The information flow factors that I consider here include givenness of the Shared Nominal and the function of the relative clause. These factors have been shown by Fox (1987) and Fox and Thompson (1990) to be useful in looking at relative clauses in spoken data from English as well as spoken data from Tagalog and Toba Batak, two Western Austronesian languages related to Indonesian.

The relative clauses in the data I examined typically serve one of three functions. The first is to characterize or describe the Shared Nominal, as illustrated in (7).

(7) Characterizing Function:
Dua lubang peluru menembus tubuhnya [yang terjungkal di sungai kering].
‘Two bullet holes pierced his body [which had fallen into a dry stream].’

In this example, the relative clause describes the condition of the referent of the Shared Nominal, but does not serve to identify it or locate it within the ongoing discourse.

In contrast, the second discourse function, grounding, refers to establishing the relevance of a referent by tying it to the ongoing discourse. This is typically done in one of two ways. The first type of grounding is what has been called anchoring by Prince (1981): a noun phrase is made identifiable by being linked to a Given noun phrase which is properly contained within it, as in example (8).

(8) Grounding by Anchoring:
Jahjo memergoki Kijang [yang diburunya]  
Jahjo catch kind.of.car REL PASS.chase.3AG
‘Jahjo caught the Kijang [that he had been chasing].’

We see that the A element within the relative clause is the pronominal third person enclitic, -nya, which is attached to the verb diburu ‘to chase’. This relative clause is used to anchor the referent of its Shared Nominal. Kijang, the car, is anchored by its connection to Jahjo, the Given referent of -nya.

The second type of grounding that will be discussed is proposition linking. In this case, the relative clause links the referent to a frame invoked earlier in the discourse, as in (9). In this example the referent of the Shared Nominal, Sutarno, is a new character and is made relevant to the discourse by his participation in the situation invoked by an earlier mention of traffic
police. In this frame, the information in the relative clause, the fact that Sutarno does not have the proper permits makes him, and his comments, relevant to the discourse.

(9) Grounding by Proposition Linking:

Mereka ini "tak mau diajak kompromi," ujar Sutarno, they this NEG want PASS.invite compromise say Sutarno salah seorang pengemudi [yang tidak mempunyai izin trayek dan one.person driver REL NEG own permit route and SIM A Umum].
drivers.license
‘They "won’t compromise", said Sutarno, a driver [who didn’t have a route permit or driver’s license].’ (37.7)

The third function performed by relative clauses in my data base is identification. This is the function often traditionally associated with relative clauses: picking out a specific referent from among a number of possible referents. This is illustrated in (10).

(10) Identification Function:

penumpang [yang duduk di depan] terbangun passenger REL sit in front wake.up
‘the passengers [who were sitting in the front] woke up’ (10.8)

Such identification often sets up a contrast: in (10), the contrast is with those passengers elsewhere in the train car.

Fox and Thompson (1990) showed how these discourse functions interact with clause structures to generate high frequencies of certain types of relative clauses. In their data, there was a very small number of A-relative clauses and this prompted them to collapse the A and S arguments into one "subject" category. In my data there are 44 A-Relatives (20% of the total). This is similar to the number of P-Relatives (57 or 27%). In addition, the functions of the A-Relatives appear to be distinct from the functions of S-Relatives. These two points motivate maintaining the separation between A and S in the present study.

Animacy of referents has also been shown to affect the frequency of certain types of relative clauses and the position in which they occur in main clauses (Fox and Thompson 1990). Therefore, in the following discussion I will examine relative clauses with human and non-human Shared Nominals separately. Some implications of these differences will be discussed later.

2. Discourse functions and the grammatical configuration of relative clauses

As mention above, the Shared Nominal of a relative clause actually has two different grammatical roles, one within the relative clause and one in the main clause. Fox and Thompson (1990) noticed, in the case of non-human nouns, that the Shared Nominal of a P-Relative frequently occurs as the A or S in the main clause. Conversely, they also noticed that the Shared Nominal
of an A- or S-Relative frequently occurs as the P in the main clause. I found a similar pattern in my data which I will discuss briefly by way of introducing the relationship between information flow and the grammatical configuration of relative clauses. I will then go on to discuss three other patterns common in my data, but not discussed by Fox and Thompson. First, still for non-human referents, I will discuss P-relatives in which the Shared Nominal also serves as P in the main clause. I will then turn to relative clauses modifying human referents. Among these there is a strikingly large number of S-relative clauses whose Shared Nominals also serve as S in the main clause. After discussing these, I will turn to A-Relatives.

2.1. Non-human Shared Nominals. Figure One illustrates the distribution of non-human relative clauses in my data base. In this graph we can see, for example, reading across the bottom to the middle set of bars, that when non-human Shared Nominals serve as the S in the main clause, they appear in A-relatives three times, in S-relatives thirteen times, and in P-relatives eighteen times.

![Figure One](image)

Roles of Shared Nominals in Main Clause

Figure One. Grammatical Role of NON-HUMAN Shared Nominal in main clause, for each of the Grammatical roles in relative clause.

2.1.1. P-Relatives with the Shared Nominal as S in the main clause. One of the main functions of relative clauses is to help ground the referent of the Shared Nominal in the ongoing discourse. P-Relatives are especially well suited for this. As has been pointed out by Du Bois (1987) and others, in naturally occurring discourse, the noun in the A position is usually Given, and often pronominal. A P-Relative will frequently contain Given material in its A position, as in example (11).
(11) Tapi para sopir di Semarang, rupanya, masih mengharap "Operasi Rok Span" [yang mereka popularkan] itu jadi kenyataan, skirt tight REL they popularize that be fact 'But apparently the drivers in Semarang still hoped that "Operation Tight Skirt" [which they had popularized] would happen.' (37.9)

The Shared Nominal operasi rok span 'operation tight skirt' serves as the P of the relative clause predicate popularkan, 'popularize'. In the main clause it serves as the S of the predicate jadi kenyataan, 'be fact'. Notice also that within the relative clause, the A element is pronominal, mereka 'they'. This Given material then anchors the Shared Nominal, "Operation Tight Skirt" to the ongoing discourse. This Shared Nominal is in the S position in the main clause. Such S arguments are not typically provided with a predication which can serve to anchor them in the main clause, so the discourse function of grounding is frequently provided by P-Relatives.

2.1.2. S-Relatives with the Shared Nominal as P in the main clause. Another frequent function of relative clauses is to characterize the Shared Nominal. Intransitive predications are especially well suited for this, as they often provide descriptive material of some sort. Example (12) illustrates an S-Relative which characterizes the referent of the Shared Nominal kepercayaan 'belief' as 'derived from rumors'.

(12) ternyata apparently mereka they sedang PROG menjalankan conduct kepercayaan belief kepercayaan REL [yang from isu] from rumor 'It seemed they had a belief [that derived from rumors].' (55.3)

Fox and Thompson noted that S-Relatives, because they do not serve a grounding function, are often associated with New referents which are in the P argument position in the main clause. This is because a noun in the P position in the main clause is frequently already grounded by association with the typically Given referent in the A position. In (12) the pronoun mereka 'they' grounds the New P argument kepercayaan 'belief'. A grounding relative clause is thus not necessary and so in such situations, relative clauses are more often exploited for their characterizing function, typically with an S-relative.

2.1.3. P-Relatives with the Shared Nominal as P in the main clause. We will now turn to a relative clause configuration not discussed in Fox and Thompson (1990), P-Relatives whose Shared Nominals act as the P in the main clause. In this combination in my data, the Shared Nominal almost always refers to New information. But unlike the Shared Nominal of an S-Relative that serves as P in the main clause, a Shared Nominal of a P-Relative that serves as P in the main clause is usually not grounded by the main clause. This is precisely the reason these occur with P-relatives which, as mentioned above, can typically provide grounding because the A argument
within the relative clause is usually Given material. This grounding function of P-Relatives is useful when the main clause does not contain referents that could serve to ground the Shared Nominal as in (13). In this example *gedung* ‘building’ represents New information, but is not grounded by any Given information in the main clause. (In fact it serves later in the clause to ground another New referent, *pemilik* ‘owner’.) Instead, the grounding comes from the Given A argument within the relative clause, *mereka* ‘they’.

(13) Karena *gedung* [yang mereka pakai] diminta kembali pemiliknya.  
Because building REL they use PASS.request return owner.3POS
Because the building [that they had been using] was requested back by its owner.’ (61.4)

In other cases, P-Relatives function to characterize the Shared Nominal. These are often relative clauses in which an A argument is not mentioned, and its referent may be unknown, as in (14):

(14) *Keris* [yang diberi nama Singkir Geni] itu pun dirawat  
‘dagger’ [REL PAS.give name Singkir Geni that PART PASS.care.for
Mbah Salim sebaik-baiknya.  
Mbah Salim well.as.possible
‘Mbah Salim took care of the dagger, [which was given the name Singkir Geni], as well as possible.’ (53.3)

In such cases, the relative clause can offer no anchoring. The Shared Nominal is typically Given, or may be anchored in the main clause. In (14) the Shared Nominal *keris* ‘dagger’, is Given information. The relative clause can be used to characterize the Shared Nominal, because grounding is not needed. Interestingly, the majority of P-Relatives in my data are low in scalar transitivity as discussed in Hopper and Thompson (1980) and often contain verbs low in kinesis, such as ‘to receive’, ‘to own’, ‘to know’ and ‘to need’. This is consistent with the function of relative clauses to characterize or to ground referents, rather than to assert events.

Figure Two. Grammatical Role of HUMAN Shared Nominal in main clause, for each of the Grammatical roles in relative clause.
2.2. Human Shared Nominals. Figure Two shows the distribution of relative clause types for each of the direct arguments in main clauses for Shared Nominals with human referents. The two striking patterns which will be discussed below are the overwhelming number of S-Relatives that occur with the Shared Nominal as S in the main clause and the large number, compared to non-human referents, of A-Relatives.

2.2.1. S-Relatives with the Shared Nominal as S in the main clause. The discourse function of identifying was not found frequently among relative clauses with non-human Shared Nominals. Identifying does, however, serve an important function among relatives with human Shared Nominals, especially S-Relatives when the Shared Nominal also acts as S in the main clause, as illustrated in (15).

(15) **Toh tidak semua wanita bisa lombaan: hanya gadis atau EMPH not all women can compete only **girl **wanita** [yang belum menikah] **yang bisa menjadi peserta.**

woman REL not.yet married REL can become participant

*Not all women can compete: only girls or women [who aren’t married] can be participants. (85.3)*

Over one third of the S-Relatives whose heads serve as S in the main clause have such an identifying function. In these cases a general class of referents has been introduced in the discourse, e.g. `wanita` ‘women’ in (15). This group is then narrowed to a subset by the relative clause, only unmarried women. The specific referent of the Shared Nominal of such an identifying relative clause is technically New, but is usually inferable from the previous discourse.

Another factor in the large number of S-Relatives in my study is that I have classified verbs of saying as intransitive, and their subjects as S’s. This decision was made on the grounds that verbs of saying are generally very low in transitivity. When the S arguments of these verbs of saying take S-Relative clauses, these clauses serve to characterize the referent of the Shared Nominal phrase as in example (16).

(16) **"Karena dia orang Menado," kata **Mamuaya [yang berasal dari Tomohon, Sulawesi Utara.**

because 3SG person Menado say Mamuaya REL originate from Tomohon Sulawesi north

"Because he’s a Menado person," said Mamuaya, [who came from Tomohon, North Sulawesi].’ (98.14)

In this example, the characterization helps to legitimize the speaker’s words since Menado is in North Sulawesi. It may be that the semantically bleached quality of verbs of saying offers an opportunity for their subject nouns to be further elaborated without undue informational strain. This elaboration is easily accomplished through the addition of a relative clause. In these situations, the speaker is usually a Given referent and the relative clause generally functions to add extra information characterizing the referent.
This same configuration of relative clause often involves main clauses with predications which Cumming (1991) describes as presentative. These include the existential verb ada, as well as semantically related constructions which also serve to introduce New referents into the discourse. When these presentative predications are used to introduce totally New referents the relative clauses serve to characterize. This characterization, as exemplified in (17), can also serve to help develop the presentative nature of the entire sentence.

(17) Tak ada tukang tambal ban [yang tampak].
    NEG exist worker fix tire REL visible
    'There was no tire repairman [(who was) to be seen].' (101.6)

The three discourse functions described above are primarily associated with human referents and would thus help to explain why so many of these relatives are found with human referents. Speaking is clearly an activity of humans (or anthropomorphized entities). Presentative constructions are used to introduce participants into the narrative and the stories analyzed here are (like much human discourse) primarily about humans. Similarly the function of identifying subsets of larger groups seems especially appropriate for pointing out the (again human) main participants in the discourse. This helps to explain why S-relatives with the Shared Nominal in the S position in the main clause are so frequent for human referents.

2.2.2. A-Relatives. A-Relatives can serve to make nouns relevant to the discourse by associating them with Given material in the P of the relative clause, as in (18).

(18) Banyak tamu dari Jakarta [yang menemuinya]
    many visitors from Jakarta REL meet.3PRS
    'There are many visitors from Jakarta [who have meet him].' (34.24)

In this example, the third person pronominal enclitic -nya on the verb menemui 'to meet', grounds the New referent of the Shared Nominal.

A-Relatives can also serve the function of grounding through proposition linking, when the P referent is not Given, but the propositional content of the relative clause is related to the ongoing discourse, as in (19).

(19) Penduduk [yang dapat laporan] datang mengapung bersenjata
    residents REL receive report come surround armed
    sabit, tongkat dan parang,
    sickle stick and knife
    'The residents [who heard the news] came around, armed with sickles, sticks, and knives.' (42.7)

In this example, the P in the relative clause, laporan 'report', is New information, but is clearly inferable as a report about the events which had just been described in the preceding discourse. This is an example of an
A-relative functioning as a proposition linking form of grounding for the New referent of the Shared Nominal, *penduduk* 'residents'.

A-Relatives can serve important discourse functions by grounding the Shared Nominal through either anchoring or proposition linking. The A position in a transitive clause, as well as typically being Given, is also typically filled by human referents in naturally occurring discourse. This fact makes A-Relatives especially well suited for grounding human referents. As illustrated in Figure Three, 35 out of 44 or 80% of the A-Relatives are used with human referents. This is in marked contrast to P-Relatives, which are most frequently used with non-human referents.

![Roles of Shared Nominals in Relative Clause](image)

**Figure Three.** Animacy of Shared Nominal

Interestingly, however, both Fox (1987) and Fox and Thompson (1990) found very few A-Relatives in the data they examined, while there were large numbers of S- and P-Relatives. Indeed the frequent occurrence of S- and P-Relatives in English as well as the Western Austronesian languages Tagalog and Toba Batak led Fox (1987) to propose an Absolutive Hypothesis which claims that languages must have mechanisms for producing S- and P-Relatives. In my data, however, A-Relatives and P-Relatives occur with nearly the same frequency. Why should this be? A first guess might be that Indonesian makes very different use of relative clauses than do English or even related Western Austronesian languages. I would suggest however that the difference is more likely due to medium. The data that Fox and Thompson examined were from spoken discourse, while my data were written.

It has been suggested that the reason relatives made on the A argument do not occur frequently is a manifestation, in relative clauses, of what Du Bois (1987) calls Preferred Argument Structure. According to Preferred Argument Structure, in naturally occurring discourse clauses tend to have only one
argument which is a full noun phrase. This argument will be the S in an
intransitive clause, and will tend to be the P of a transitive clause because of
the preference mentioned earlier for Given, pronominal A arguments. Fox
(1987) suggests that preferred argument structure is not disrupted by
relativization. In other words, an A-Relative with a full noun phrase as the
Shared Nominal and a full noun phrase as the P argument would violate
preferred argument structure and would therefore be dispreferred in spoken
discourse. But as has been pointed out by Chafe (1987) and others, written
language tends to package larger amounts of information into single units
than is typical for spoken language. A-Relatives tend to do exactly this.
Although this makes them a dispreferred relative clause type in spoken
language, their greater information density is not a problem for written
discourse. And so, in written discourse, it is possible for A-Relatives to be
utilized for their important grounding functions. And, because the referents
of A arguments are generally human, A-relatives are especially frequent with
human Shared Nominals.

3. Conclusion

I hope to have shown that information flow factors can be used to help
explain the distribution of certain types of relative clauses in written
Indonesian. While these factors may tend to encourage the frequent use of
some configurations of relative clauses (e.g. S-Relatives when the Shared
Nominal is the P of the main clause, or P-Relatives when the Shared Nominal
is the S of the main clause), these same discourse factors are also exploitable
by speakers making use of other configurations of relative clauses.
Information flow, in conjunction with what is known about differences in
written and spoken language can explain the high frequency of A-Relatives
in my data. Clearly further research examining both written and spoken data
is needed to develop a more detailed picture of variation in relative clause
use in Indonesian.

Notes

1. I would like to thank everyone at the Linguistics Department of the
University of California at Santa Barbara, most especially Sandra Thompson,
Marianne Mithun, and Tsuyoshi Ono, whose comments and suggestions
helped shape this paper. I, of course, retain responsibility for any errors or
shortcomings.

2. Numbering at the end of examples refers to their location by page
and sentence number in Setiawan (1987).

3. A passive-like construction is used obligatorily in P-Relatives. While
this syntactic requirement raises interesting theoretical issues, e.g. for the
Accessibility Hierarchy proposed by Keenan and Comrie (1977), it will not be
dealt with here as it does not directly affect the issues discussed.
4. It is possible to have verbs of saying with overt transitive morphology in Indonesian. However, all the examples of verbs of saying in my database are bare stems without the morphology typically associated with Indonesian transitive clauses (e.g. the voice-marking prefixes meng- and di- or the suffixes -kan and -i).

References


Fox, Barbara. 1987. The noun phrase accessibility hierarchy: Subject primacy or the absolutive hypothesis? Language 63:856-870.


1.0 Introduction

According to the Dongxiang Language Dictionary, 50% of the Dongxiang lexicon consists of Hui loans. In light of this situation, this paper seeks to answer the following questions:

1) What factors led Dongxiang to borrow so extensively from Hui?
2) Is there a predominant grammatical category to which Hui loans belong?
3) How reliable is the Dongxiang Language Dictionary with respect to Hui loans?
4) What are the percentages of Hui loans in natural language use and how do they function?

2.0 Background

The Dongxiang (or Santa) nationality, with a population of over 280,000, is one of the officially recognized national minorities of China. They live in southern Gansu province in the mountainous Dongxiang Autonomous County. As you can see in the map below, Dongxiang Autonomous County (located in the lower right hand portion of the map) is situated to the southwest of Lanzhou and east of the town of Linxia. Linxia has been an important trade and Islamic center for most of the minority nationalities of Gansu and Qinghai province since the Yuan dynasty (13th century A.D.). The Chinese name Dongxiang, literally 'east villages', was given to the people by the Hui and Han inhabitants of Linxia on account of the fact that the Dongxiang villages are located east of Linxia. However, the Dongxiang people call themselves 'santa' which is probably derived from the Middle Mongolian word referring to the Muslims of Central Asia. In this paper I will refer to the people and the language as Dongxiang.

The Dongxiang language is significantly different from and mutually unintelligible with any other member of the Mongolian language family. These include three Mongolian languages spoken in the Qinghai/Gansu border region. They are Eastern Yellow Uighur (not related to the Uighur spoken in western China), Mongour (or Tuzu), and Baonan (or Bao'an). The regions where both dialects of Baonan are spoken and one of the two dialects of Mongour is spoken are also indicated on the map below.

There is a great deal of ethnological and historical evidence suggesting that the Dongxiang people were Islamic artisans of Central Asia captured by the Mongolian Army on its western expeditions during the thirteenth century. They have been classified as se mu ren, 'people with colored eyes', belonging to different ethnic groups speaking different languages in Central Asia. After being
captured by the Mongols, they were forced to acquire the language of their masters and settle in their present home land. (See Ma & Ma, 1982). This evidence strongly suggests that the Dongxiang language was originally a Mongolian pidgin. Another piece of evidence that supports this hypothesis is that the Dongxiang people do not consider themselves to be of Mongolian descent. If Dongxiang was originally a pidgin (and therefore cannot be considered a direct genetic descendant of Middle Mongolian), then this fact may account for a number of striking differences between Dongxiang Mongolian and Khalkha Mongolian spoken in Mongolia. These differences include a lack of vowel harmony, a lack of phonemic vowel length, and a reduced aspectual system. Although the possibility of internal change should not be ignored, these differences are quite possibly results of imperfect learning by the Dongxiang speakers of their target language, which was probably some form of Middle Mongolian.

If we accept the fact that Dongxiang was originally a Mongolian pidgin, then it is safe to assume that at an earlier stage in the language, the lexicon was sparse. My hypothesis is that, due to an impoverished lexicon and the contributing sociological factors, the Dongxiang people subsequently incorporated large numbers of loanwords from the Hui people of Linxia. You can see on the map above that Linxia is situated just west of the region where the Dongxiang people live.
3.0 Language Contact and Borrowing

The Hui people of Linxia speak a northwestern Mandarin dialect. It differs from the Han Chinese dialect spoken in the same area, also a northwestern Mandarin dialect, in that it is SOV, not SVO; has only three tones as opposed to four; and exhibits a case system as well. (For more discussion of Hui see Li, 1984).

Linxia has been an important cultural, commercial, and Islamic center for the Hui and other national minorities in southern Gansu for centuries. Thus it is likely that the Hui and the Dongxiang people have been interacting with each other for an extended period of time.

A number of social factors contribute to language contact between the Hui and the Dongxiang. These include 1) Dongxiang Autonomous County’s close proximity to Linxia; 2) the Hui greatly outnumbering the Dongxiang (no exact figures are available for the Hui); 3) both the Hui and the Dongxiang people being Muslim and not ethnically identifying themselves as Han Chinese; and 4) the dominance of the Hui culture. The intensity of this contact is reflected in Dongxiang’s extensive borrowings from Hui in phonology, morphosyntax, and the lexicon.

In (1) below is the ‘borrowing scale’ proposed by Thomason and Kaufman in their 1988 publication, ‘Language Contact, Creolization, and Genetic Linguistics’. The purpose of their scale is first, to show that there is a correlation between intensity of contact (from casual contact to very strong cultural pressure) and extent of borrowing (from lexical borrowing only to heavy structural borrowing); and secondly, to classify languages according to this scale.

(1) Borrowing Scale (Thomason & Kaufman, 1988)

Type 1 Casual contact: lexical borrowing only
Type 2 Slightly more intense contact: slight structural borrowing
Type 3 More intense contact: slightly more intense structural borrowing
Type 4 Strong cultural pressure: moderate structural borrowing
Type 5 Very strong cultural pressure: heavy structural borrowing

If we place Dongxiang on this scale, it falls somewhere between types 4 and 5. Evidence for this is summarized in (2) below.

(2) Dongxiang borrowings from Hui
Lexicon: Strong influence from Hui
50% Hui loan words (according to the Dongxiang Language Dictionary)
Phonology: Moderate influence from Hui
Ultimate stress, progression towards pitch
accent as in Baonan?

Morphosyntax: Moderate influence from Hui
Resultative construction
Optional use of copula shi in equi-constructions
Use of adverbs yijing ‘already’ and zheng ‘PROG’
to clarify aspectual relations

A type 4 language on Thomason & Kaufman’s borrowing scale has not
only experienced extensive lexical borrowing, but phonological and
morphosyntactic borrowing as well. Phonologically, stress in Dongxiang
Mongolian does not conform to the pattern of stress in Khalkha Mongolian.
According to Poppe (1970), when there are no phonemically long vowels or
diphthongs in the word, Khalkha Mongolian has initial stress. Dongxiang,
however, has ultimate stress and furthermore it is not affected by phonemic vowel
length (a moot point since there isn’t any) nor by diphthongs. This may be
related to the phenomenon documented by Charles N. Li in Baonan Mongolian
where tonal distinctions have developed on Hui loanwords. (For more discussion
on this topic see Li, 1986).

Structurally, Dongxiang exhibits a number of constructions borrowed from
Hui which include the resultative construction, the optional use of the copula shi
in equi-constructions, and a frequent use of adverbs such as yijing ‘already’ and
zheng ‘PROG’ to clarify aspectual relations. In this paper, I will concentrate
primarily on the lexicon.

4.0 The Lexicon

In this section I will discuss Hui loanwords in the Dongxiang lexicon and
more specifically borrowed nouns, verbs, and adverbs.

Example (3) below is a tabulation of all the primary entries in the
Dongxiangyu Cihui, the Dongxiang Language Dictionary (DLD henceforth),
published in the Mongolian Language and Dialect Series in 1983 by the
University of Inner Mongolia at Huhehot in the People’s Republic of China,
which is the most complete of its kind to date. For the purposes of the tabulation
below, I counted only primary entries as opposed to secondary entries because
secondary entries are generally composed of at least two primary entries and I
didn’t want to count an entry twice. The editors of the dictionary listed the part
of speech and the source language of each entry. Although I feel a number of the
categorizations are internally inconsistent, I have made no attempt to rectify this
situation. Therefore, the tabulation in (3) below reflects the editor’s
categorizations and not mine.

A few points about other categories. Adjectives rank as a commonly
borrowed category at 37%. This is not uncommon because adjectives are usually
more nominal in nature. All numerals above ten are borrowed from Hui. There is a Dongxiang word for twenty but it is not commonly used. Measure words are also a commonly borrowed category at 50%, but these should not be confused with classifiers which are not borrowed.

(3) Lexical items by category and source language. (According to the Dongxiang Language Dictionary, 1983)

<table>
<thead>
<tr>
<th></th>
<th>Dongxiang</th>
<th>Hui Loans</th>
<th>Other Loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun</td>
<td>558 32%</td>
<td>1110 65%</td>
<td>51 3% = 1719</td>
</tr>
<tr>
<td>Verb</td>
<td>556 62%</td>
<td>334 37%</td>
<td>3 .3% = 893</td>
</tr>
<tr>
<td>Adjective</td>
<td>146 63%</td>
<td>85 37%</td>
<td>0 0% = 231</td>
</tr>
<tr>
<td>Pronoun</td>
<td>72 96%</td>
<td>2 3%</td>
<td>1 1% = 75</td>
</tr>
<tr>
<td>Onomatopoeia</td>
<td>45 98%</td>
<td>1 2%</td>
<td>0 0% = 46</td>
</tr>
<tr>
<td>Numerals</td>
<td>42 70%</td>
<td>18 30%</td>
<td>0 0% = 60</td>
</tr>
<tr>
<td>Adverbs</td>
<td>29 60%</td>
<td>19 40%</td>
<td>0 0% = 48</td>
</tr>
<tr>
<td>Interjections</td>
<td>17 100%</td>
<td>0 0%</td>
<td>0 0% = 17</td>
</tr>
<tr>
<td>Time/Place</td>
<td>16 100%</td>
<td>0 0%</td>
<td>0 0% = 16</td>
</tr>
<tr>
<td>Auxiliary Verbs</td>
<td>9 90%</td>
<td>1 10%</td>
<td>0 0% = 10</td>
</tr>
<tr>
<td>Measure Words</td>
<td>6 50%</td>
<td>6 50%</td>
<td>0 0% = 12</td>
</tr>
<tr>
<td>Suffixes</td>
<td>6 86%</td>
<td>1 14%</td>
<td>0 0% = 7</td>
</tr>
<tr>
<td>Mood Words</td>
<td>5 83%</td>
<td>1 17%</td>
<td>0 0% = 6</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>3 75%</td>
<td>1 25%</td>
<td>0 0% = 4</td>
</tr>
<tr>
<td>Totals</td>
<td>1510 48%</td>
<td>1579 50%</td>
<td>55 2% = 3144</td>
</tr>
</tbody>
</table>

4.1 Borrowed Nouns

The most striking fact about (3) is the number of borrowed nouns from Hui, 1110 or 65%. There are twice as many borrowed nouns as there are indigenous Dongxiang nouns. This fact seems to indicate the pervasiveness of Hui nouns in the Dongxiang lexicon, but these results may be biased on two accounts.

First, researchers working on this project may have failed to elicit a large number of Dongxiang lexical items due to a lack of understanding of the Dongxiang culture. An analogous example (personal communication with Charles N. Li) is that Baonan Mongolian has numerous words for different types of horses. If one didn’t understand this aspect of their culture, one might overlook this and simply ask what was the Baonan word for ‘horse’ and fail to elicit a host of other words describing different types of horses.

Secondly, a large number of words may have been elicited that are not an inherent part of Dongxiang society and culture. Since a large portion of the Dongxiang population is bilingual, if a language consultant were asked what was the Dongxiang word for something that is not a part of his culture, he may simply
In (5), the Hui loan is dayı 'agree, agreement' and it co-occurs with the auxiliary giə- which in turn tales the aspectual marking. In (6), the Hui loan is tiao 'jump' (pronounced as dzio in Hui and Dongxiang) and it takes the derivational suffix -yi.

-yi/-dzi does not occur on indigenous Dongxiang verbs. giə- 'do', however, does occur with indigenous Dongxiang words and appears to be derivational in character, deriving verbs from nouns. Using an auxiliary 'do' to derive verbs from borrowed nouns is a common phenomenon and is attested in a number of typologically diverse languages. This may also suggest, by analogy, that the suffix -yi/-dzi also derives verbs from borrowed nouns (as opposed to simply marking borrowed verbs) and thus would conform to the already established tendency in Dongxiang to borrow nouns rather than verbs. Out of 334 verbal entries, 107 or 32% took giə-, and 151 or 46% took -yi/-dzi. Thus 258 or 78% of all verbal entries were actually derived from nouns. If we count these as borrowed nouns, altogether 1368 of 1579 Hui borrowings or 87% are noun borrowings according to the DLD.

Another manner in which Hui loans are derived as verbs is to use one of many productive derivational suffixes in Dongxiang.

In (7) above, the Hui loan dżiə 'to stick out' takes the derivational suffix -da. 55 or 16% of the verbal entries are of this variety and take a number of different indigenous derivational suffixes. In some sense, these may be considered more marked. In my data, I found an instance where dzio 'jump' occurred with a suffix other than -yi. Compare (6) with (8) below.
substitute the respective Hui word in response. The nouns listed in (4) below are only a few examples from the DLD that illustrate this problem.

\[
\begin{array}{ll}
4) & \text{dān} \\
   & \text{dānyan} \\
   & \text{gōmin} \\
   & \text{gōngse} \\
   & \text{dzuçi} \\
   & \text{fangiæmin}
\end{array}
\]

\text{political party} \\
\text{party member} \\
\text{revolution} \\
\text{commune} \\
\text{Chairman Mao} \\
\text{someone against the revolution}

In order to alleviate this bias, one should avoid inclusion of borrowed words in a dictionary if they in fact do not occur in natural language use such as conversations and narratives. I will return to this point in section 5.0.

4.2 Borrowed Verbs

According to (3), 37% of verbs in the Dongxiang lexicon are Hui loans. This figure is significantly lower than the possibly inflated 65% for borrowed Hui nouns. Although nouns borrowed from Hui can, so to speak, fill the same slot as a Dongxiang noun, this is not the case for borrowed verbs. If the loan is disyllabic, then the auxiliary verb giæ- ‘do’ used. If the loan is monosyllabic, then the derivational suffix -yi/-dzi is used (-yi for vowel finals, and -dzi for nasal finals). See examples (5) and (6) below:

\[
\begin{array}{ll}
\text{(5) } & \text{in giæ-se caladzi dayin giæ-dziwe.} \\
   & \text{like this do-COND pheasant agree do-ASP} \\
   & \text{And so the pheasant agreed.}
\end{array}
\]

\[
\begin{array}{ll}
\text{(6) } & \text{nie dziovise one kwan enda bo ire wo.} \\
   & \text{one jump-BWS-COND this boy fall down come ASP} \\
   & \text{With one jump the boy fall down (from the horse).}
\end{array}
\]

In (5), the Hui loan is dayin ‘agree, agreement’ and it co-occurs with the auxiliary giæ- which in turn tells the aspectual marking. In (6), the Hui loan is tiao ‘jump’ (pronounced as dzio in Hui and Dongxiang) and it takes the derivational suffix -yi.

-yi/-dzi does not occur on indigenous Dongxiang verbs. giæ- ‘do’, however, does occur with indigenous Dongxiang words and appears to be derivational in character, deriving verbs from nouns. Using an auxiliary ‘do’ to
derive verbs from borrowed nouns is a common phenomenon and is attested in a number of typologically diverse languages. This may also suggest, by analogy, that the suffix -yi/-dzi also derives verbs from borrowed nouns (as opposed to simply marking borrowed verbs) and thus would conform to the already established tendency in Dongxiang to borrow nouns rather than verbs. Out of 334 verbal entries, 107 or 32% took gio- - and 151 or 46% took -yi/-dzi. Thus 258 or 78% of all verbal entries were actually derived from nouns. If we count these as borrowed nouns, altogether 1368 of 1579 Hui borrowings or 87% are noun borrowings according to the DLD.

Another manner in which Hui loans are derived as verbs is to use one of many productive derivational suffixes in Dongxiang.

(7) sadzi wi cudzunni dzidaka swunu,
sadzi wi cudzun-ni dz1-da-wa swunu magpie neck-GEN stick-BWS-CAUS after,
After the magpie had stuck his neck out (with pride),

In (7), the Hui loan dz1 ‘to stick out’ takes the derivational suffix -da. 55 or 16% of the verbal entries are of this variety and take a number of different indigenous derivational suffixes. In some sense, these may be considered more marked. In my data, I found an instance where dzio ‘jump’ occurred with a suffix other than -yi. Compare (6) with (8) below.

(8) dz1g1 tsatsadzi dziolie tci wo.
dz1-g1 tsa-tsa-dzi dzio-lie tci wo. only-COP magpie.chatter-REDP-SUF jump-BWS begin ASP He could only begin to jump around chattering like a magpie.

In (8), the loan dzio ‘jump’ takes the suffix -lie and not -yi. As it turns out, tci ‘begin’ in example (8) is also a borrowing. (tci is one of the few examples of a verb apparently borrowed as a verb and it is not morphologically marked as a borrowing). When tci occurs in the V2 position of a V1 V2 serial verb construction, V1 must take the suffix -lie. From this we can see that in certain circumstances the unmarked suffix -yi/-dzi is overridden by grammatical considerations. This interplay has not been fully investigated at this time but certainly merits further consideration.

Altogether, 99% of the verbal entries in the DLD were marked by a suffix or an auxiliary verb. This supports the assumption that nouns are more easily borrowed and that verbs are rarely borrowed as such.
4.3 Borrowed Adverbs

Although the DLD only lists 19 borrowed adverbs, my data (see 5.0 below) reveals that adverbs are one of the most commonly borrowed grammatical categories which occur in natural language use. Example (8) above has an adverb, džsə ‘only’ in second position (the subject has been dropped because it is understood). This position is the same position adverbs usually occupy in Hui. In (9) below, there are two borrowed adverbs, džwɨn ‘PROG’ which lexically marks the progressive aspect and ifox ‘after’ which subordinates this clause to the next.

(9)

\[
\begin{align*}
\text{bi & ʂida & džwɨn & yawu-dzɨ & etʂɨ & ifox,} \\
\text{bi & ʂida & džwɨn & yawu-dzɨ & etʂɨ & ifox} \\
\text{1SGNOM close.to PROG walk-SUBD go after,} \\
\text{After walking up closer,} \\
\text{ẹne kewənɨ fuyi & bwsɨ & ire-sə & wo.} \\
\text{ẹne kewən-ni fu-yi & bwsɨ & ire-sə & wo} \\
\text{this boy-GEN help-BWS stand.up come-CAUS ASP} \\
\text{(I) helped this boy to stand up.}
\end{align*}
\]

Although it is not clear to me at this point why borrowed adverbs occur so frequently, I postulate that their function is to clarify the aspectual relations present in the proposition. One reason why this might be so is that the Dongxiang aspectual system is depleted when compared to the neighboring Mongolian languages Baonan and Mongour and also when compared to Khalkha Mongolian. This depletion may be a direct result of its origin as a pidgin.

5.0 Two Dongxiang Narrative Texts

Returning to the issue of looking at Hui loanwords from the perspective of natural language use, I counted Hui loanwords for types and tokens\textsuperscript{5} in two Dongxiang narrative texts from two different speakers. The first, "The magpie and the pheasant", is a folktale and the second, "A boy and his horse" is the retelling of an incident that actually occurred involving the speaker. The results of "The magpie and the pheasant" and "A boy and his horse" are tabulated below in (10) and (11) respectively.
Hui Borrowings in "The magpie and the pheasant"

<table>
<thead>
<tr>
<th>Types</th>
<th>gloss</th>
<th>category</th>
<th>tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. yadži</td>
<td>duck</td>
<td>noun</td>
<td>1</td>
</tr>
<tr>
<td>2. kušt</td>
<td>story</td>
<td>noun</td>
<td>1</td>
</tr>
<tr>
<td>3. dadžia</td>
<td>everybody</td>
<td>pronoun</td>
<td>2</td>
</tr>
<tr>
<td>4. xan</td>
<td>very</td>
<td>adverb</td>
<td>1</td>
</tr>
<tr>
<td>5. dži</td>
<td>only</td>
<td>adverb</td>
<td>1</td>
</tr>
<tr>
<td>6. džiši</td>
<td>only</td>
<td>adverb</td>
<td>2</td>
</tr>
<tr>
<td>7. ye</td>
<td>also</td>
<td>adverb</td>
<td>2</td>
</tr>
<tr>
<td>8. idžiš</td>
<td>already</td>
<td>adverb</td>
<td>4</td>
</tr>
<tr>
<td>9. tṣatšadzi</td>
<td>magpie.chatter</td>
<td>onomat.</td>
<td>1</td>
</tr>
<tr>
<td>10. dzioljia-</td>
<td>jump</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>11. dodžia gie-</td>
<td>reach a high level</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>12. dayiš gi-</td>
<td>agree</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>13. dzud-</td>
<td>stick out</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>14. tći-</td>
<td>begin</td>
<td>verb</td>
<td>3</td>
</tr>
</tbody>
</table>

Hui Borrowings in "A boy and his horse"

<table>
<thead>
<tr>
<th>Types</th>
<th>gloss</th>
<th>category</th>
<th>tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. älltši</td>
<td>matte</td>
<td>noun</td>
<td>1</td>
</tr>
<tr>
<td>2. idži</td>
<td>all the way</td>
<td>adverb</td>
<td>1</td>
</tr>
<tr>
<td>3. ixo</td>
<td>after</td>
<td>adverb</td>
<td>2</td>
</tr>
<tr>
<td>4. dzuŋ</td>
<td>PROG</td>
<td>adverb</td>
<td>3</td>
</tr>
<tr>
<td>5. yayi</td>
<td>frightened</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>6. tšayi</td>
<td>surprised</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>7. dzioyi-</td>
<td>jump</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>8. layi-</td>
<td>pull</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>9. pundzi-</td>
<td>meet</td>
<td>verb</td>
<td>1</td>
</tr>
<tr>
<td>10. fuyi-</td>
<td>help</td>
<td>verb</td>
<td>2</td>
</tr>
</tbody>
</table>

In "The magpie and the pheasant", there are 14 borrowed types out of a total of 87 and there are 22 borrowed tokens out of a total of 186. Thus, 16% of the types and 12% of the tokens are borrowed. In "A boy and his horse", there are 10 borrowed types out of a total of 66 and there are 14 borrowed tokens out of a total of 135. Thus, 15% of the types and 10% of the tokens are borrowed. Even though one of these texts is a folktale and one is a narrative, the results are similar: 1) borrowed nouns are infrequent for both types and tokens; 2) borrowed verb types are the most frequent followed by adverbs - 10 and 8 respectively for both texts; 3) borrowed adverb tokens are the most frequent followed by verbs - 16 and 14 respectively for both texts.

This distribution is in striking contrast to the impression given by the DLD where nouns are the most predominantly borrowed grammatical category. This study reveals that the distribution of borrowed words in the lexicon and the distribution of borrowed words in natural language use is quite different and merits further study.
6.0 Conclusion

The ethnological and historical evidence suggests that Dongxiang was originally a pidgin. Subsequently, sociological factors contributed to the incorporation of large numbers of Hui loanwords into the previously impoverished lexicon. Although the Dongxiang Language Dictionary indicates that 50% of the Dongxiang lexicon consists of Hui loans, this figure is misleading because only 10 to 12 percent of tokens and 15 to 16 percent of types used in Dongxiang conversations and narratives are of Hui origin. Therefore the previously accepted notion of the extent to which Dongxiang has been sinicized with respect to its vocabulary must be re-examined in the light of natural language use.

Furthermore, even though the Dongxiang Language Dictionary is probably slanted to some extent due to poor elicitation techniques, nouns are still the most predominantly borrowed grammatical category. Borrowed nouns may fill the same slot as indigenous Dongxiang nouns. Conversely, 99% of all loans functioning as verbs in Dongxiang carry some sort of morphological marking. This suggests that verbs are rarely borrowed as verbs, but rather are derived from borrowed nouns. Thus the overall pattern still conforms to the borrowing of nouns.

Finally, two Dongxiang narrative texts revealed that although nouns are the most predominantly borrowed grammatical category, verbs and adverbs occur more frequently in natural language use. The frequency of borrowed nouns is most likely subject dependant while the frequency of borrowed verbs is less so. Adverbs are likely to occur more frequently in natural language use because their frequency is not subject dependant and because their function is to clarify the aspectual relations present in the proposition.

Notes

1. This research was made possible by two grants from the University of California at Santa Barbara: The Humanities/Social Sciences Research Grant and the Interdisciplinary Humanities Center Predoctoral Grant. I would like to thank the UCSB linguistics faculty for their invaluable advice, especially Sandra Thompson, Marianne Mithun, and Charles N. Li. I would also like to thank my fellow graduate students for their support.

2. This map is from Longman’s Language Atlas of China (1988), C-2, Mongolian Languages.

3. ‘Other Loans’ includes borrowings from Arabic, Uighur, Persian, Tibetan, and some Middle Mongolian literary terms. A majority of these are Islamic religious terms.
4. This data was collected by the author in Linxia, Gansu Province during the summer of 1990. I would like to thank my language consultants, Ma Kexiong and Ma Jun, for their contribution.

Abbreviations:
ASP = aspect
BWS = derivational borrowed word suffix
CAUS = causative
COND = conditional
COP = copula
GEN = genitive
PROG = progressive
REDP = reduplication
SUBD = subordinator
SUF = suffix

5. Types are calculated according to the first instantiation of a word. Tokens are the number of occurrences of the type.

References


The Moraic Status of Initial Geminates in Trukese
Michele E. Hart
University of California, Santa Cruz

0. Introduction. According to the version of the moraic theory outlined in Hayes (1989), geminate consonants are distinguished from ordinary consonants by being underlying moraic. Trukese is a language which poses a theoretical challenge for moraic phonology, in that it contains both medial and initial geminates.

Hayes asserts (1989: p. 303) that initial geminates, like medial geminates, may be moraic. He gives no empirical justification for their moraic status, however. The implicit theoretical argument seems to be an argument from symmetry: initial geminates are assumed a priori to be as similar as possible to medial geminates.

In this paper, I will present evidence from Trukese which supports the position that initial geminates contribute moraic weight to the word in the same way that medial geminates do, and so they should properly be viewed as moraic. By analyzing the interaction of initial geminates with prosodic processes that are sensitive to mora count, I show that the initial geminate supplies a mora. The paper is organized as follows. Section 1 provides background information. Section 2 outlines a process of delinking from the final mora of a word, a process which is sensitive to moraic weight. Compensatory lengthening and its interaction with final delinking and minimality is analyzed in Section 3; the presence of initial geminates is crucially shown to block compensatory lengthening. Section 4 presents the process of "gemination throwback", and suggests an improved representation for geminate consonants.

1. Background Information. Trukese is a Micronesian language of the Trukic subgroup. It is spoken on the islands on Truk Atoll, south of Guam. Related languages in the same subgroup include Woleaian, Ulithian, and Puluwat. The data given here are from Goodenough and Sugita (1980, 1990). All examples are in Trukese orthography; diacritics over vowels merely indicate differences in vowel quality, not any accentual marking.

All the consonants in the inventory except glides may geminate. All geminates may appear in medial or initial position. (The phonemic inventory is given as an appendix.) Provisionally, we adopt the representation of geminates assumed in Hayes (1989).

\[(1a)\]
\[
\begin{array}{ccc}
\sigma & \sigma \\
\mu & \mu & \mu \\
v & c & v
\end{array}
\]

\[(1b)\]
\[
\begin{array}{cccc}
\sigma \\
(\mu) \\
v \\
c \\
v
\end{array}
\]

Hayes suggests that, just as a medial geminate is doubly linked, to its pre-assigned mora and to the onset of the following syllable, so an initial geminate is doubly
linked, to the onset of the first syllable and to a word-initial mora which is extraprosodically licensed.\textsuperscript{1}

Syllables are maximally CCVV (\textit{nnoo.wu}, 'be disgusted) or CVVC (\textit{sóók.ku}, 'kind, way')\textsuperscript{2}. Syllables are subject to the following constraints on well-formedness:

(i) Onset satisfaction is absolute. (The effects of a rule inserting a default glide onset is not always indicated in the orthography: [yAΆ], 'fishhook' is spelled 'éé'.)

(ii) There are no complex onsets (except initial geminates).\textsuperscript{3}

(iii) There are no sequences of two unlike vowels.

(iv) Coda consonants are subject to the following restriction underlyingly: they must be both moraic and doubly-linked. From this it follows that the first half of a medial geminate is the only possible coda consonant. In fact, in the native vocabulary, even a nasal homorganic with a following obstruent is not a licit coda. All words, then, are underlyingly vowel-final: no word ends in a consonant, since there is obviously no possibility of a word-final consonant being doubly-linked.

The minimal lexical-category word in Trukese is underlyingly bimoraic: [mū]_{\text{wmin}}. All monomoraic words appear to belong to functional categories, like conjunctions and complementizers, e.g: \textit{mé}, 'and'; \textit{ngé}, 'but, while'. Following McCarthy and Prince (1986), I assume that this bimoraic unit is also the canonical foot of the language, although there is otherwise little direct evidence for foot structure, given that there is no recorded stress.\textsuperscript{4}

2. Word-Final Delinking. Stems of all lexical categories in Trukese exhibit an alternation between the form in which they appear with inflectional suffixes, equivalent to the underlying form, and the unsuffixed form. When not followed by a suffix, short stem-final vowels are deleted; long vowels become short. (2) summarizes the two basic patterns.

\begin{align*}
2. \ a. \ V & \rightarrow \ \emptyset / \_ \_ \ # \ & \text{Cf. 1st sg.} \\
/\text{omosu} / & \rightarrow \ \text{omos} \ 'turban \ shell' \ & \text{omosu-y} \\
/\text{fféni} / & \rightarrow \ \text{ffén} \ 'love' \ & \text{fféni-y} \\
/\text{mekúre} / & \rightarrow \ \text{mekúr} \ 'head' \ & \text{mekúre-y} \\
/\text{nemeneme} / & \rightarrow \ \text{nemenem} \ 'authority' \ & \text{nemeneme-y} \\

\end{align*}

\begin{align*}
2. \ b. \ VV & \rightarrow \ V / \_ \_ \ # \\
/\text{pechee} / & \rightarrow \ \text{peche} \ 'foot' \ & \text{pechee-y} \\
/\text{tikkaa} / & \rightarrow \ \text{tikka} \ 'coconut \ oil' \ & \text{tikkaa-y} \\
/\text{etiruu} / & \rightarrow \ \text{etiru} \ 'coconut \ matting' \ & \text{etiruu-y} \\
/\text{chuuchuu} / & \rightarrow \ \text{chuuchu} \ 'urine' \ & \text{chuuchuu-y} \\
\end{align*}
The shortening and deletion can be modelled as a single phenomenon: the delinking of the vowel from the final mora of the phonological word. The process is represented schematically in (3).

(3) Final Delinking

\[ \sigma \xrightarrow{\text{Wd}} \mu \xrightarrow{\text{v}} \]

A formal objection to the Final Delinking rule inevitably arises: application of this rule to long vowels is a violation of the linking constraint (Hayes 1984). The linking constraint, originally motivated as an account of geminate integrity, says that all association lines in rules must be interpreted exhaustively. Because the long final vowel in /pechee/ is doubly linked, to two moras, the linking constraint should block the delinking rule from applying in such a case, since the rule mentions only a single association line. Schein and Steriade (1986), however, offer a different analysis of geminate integrity. The Uniform Applicability Condition states any rule may apply in a doubly-linked structure, provided that its application affects segmental content uniformly. In this view, a delinking rule such as (3) may apply freely, since the segmental content remains unaffected. Derivations illustrating the application of Final Delinking are given in (4):

(4) a. mékûre $\rightarrow$ mékûr

\[ \begin{array}{c}
\sigma \\
\sigma \\
\sigma \\
\mu \\
\mu \\
\mu \\
\text{mékûre} \\
\end{array} \quad \xrightarrow{\sigma} \quad \begin{array}{c}
\sigma \\
\sigma \\
\sigma \\
\mu \\
\mu \\
\mu \\
\text{mékûre} \\
\end{array} \quad \xrightarrow{\sigma} \quad \begin{array}{c}
\sigma \\
\sigma \\
\mu \\
\mu \\
\mu \\
\text{mékûre} \\
\end{array} \]

b. pechee $\rightarrow$ peche

\[ \begin{array}{c}
\sigma \\
\mu \\
\mu \\
\mu \\
\text{pechee} \\
\end{array} \quad \xrightarrow{\sigma} \quad \begin{array}{c}
\sigma \\
\mu \\
\mu \\
\mu \\
\text{pechee} \\
\end{array} \]

When the final vowel is short (4a), Final Delinking delinks the vowel melody from the last mora (i). Now the final syllable itself undergoes "parasitic delinking" (Hayes 1989). The syllable, in Hayes' view, requires an overt nuclear element to
unlicensed and must be deleted, as shown in (ii). At this point, the consonant and vowel melodies which originally comprised the final syllable are left unassociated. The vowel melody is simply stray-erased. However, the stranded consonant, originally the onset of the final syllable, is now syllabified as a non-moraic coda (iii). Given our earlier statements about licensing of coda consonants in Trukese, what this involves is a relaxation of the requirement that coda consonants be both moraic and doubly-linked. In fact, the only singly-linked coda consonants in the language arise exclusively through resyllabification after Final Delinking - word-final coda consonants are never underlying. I would argue that the abandonment of restrictions on coda consonants can be seen as a last-ditch attempt to preserve irrecoverable melodic material.

When the final vowel is long (4b), stray erasure eliminates the last mora after it has been delinked from the vowel, since the mora, dominating no melody element, is no longer prosodically licensed. The final syllable itself remains well-formed here, since it continues to dominate a vowel, and therefore Parasitic Delinking does not occur. The derivation is complete. A question, however, arises: how exactly is it that the mora comes to be stray-erased? If syllabification is held to be a continuous process, as is generally assumed, it might be supposed that the vowel melody, once delinked from final mora, must inevitably reassociate to it, as shown in (5).

\[
\begin{align*}
\sigma & \quad \mu \\
p & \quad \mu \\
\end{align*}
\quad \rightarrow \quad
\begin{align*}
\sigma & \quad \mu \\
\mu & \quad \mu \\
p & \quad \mu \\
\end{align*}
\quad \rightarrow \quad
\begin{align*}
\sigma & \quad \mu \\
\mu & \quad \mu \\
p & \quad \mu \\
\end{align*}
\]

An appeal can be made to the Relinking Condition of Pulleyblank (1986, p. 115), which states:

Relinking Condition: When a rule of the form ... X ... applies,

\[ F \]

F is not subject to reassociation by convention on that cycle.

Although this condition was originally conceived by Pulleyblank in a tonal phonology context, its scope can legitimately be extended to prevent vacuous relinking in cases like (4b) above. The final vowel is blocked from re-linking to the same element from which it has just delinked.

How does delinking, which effectively shortens a word by a mora, interact with the bimoraic word requirement in Trukese? As it turns out, the answer varies with the lexical category - non-nouns behave differently from nouns. Considering the case of nouns first, the generalization to be made is that nouns, which like other lexical categories are underlyingly at least bimoraic, must remain minimally bimoraic on the surface.
(6) \[ [\mu \mu]_N \quad *[\mu]_N \]

<table>
<thead>
<tr>
<th>Word</th>
<th>Form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>téeé</td>
<td>(*tê)</td>
<td>'islet'</td>
</tr>
<tr>
<td>oo</td>
<td>(*o)</td>
<td>'omen'</td>
</tr>
<tr>
<td>chúú</td>
<td>(*chú)</td>
<td>'bone'</td>
</tr>
<tr>
<td>máá</td>
<td>(*má)</td>
<td>'death'</td>
</tr>
<tr>
<td>maa</td>
<td>(*ma)</td>
<td>'behavior'</td>
</tr>
</tbody>
</table>

As the forms in (6) demonstrate, a noun which is underlyingly bimoraic apparently does not undergo delinking. A form like tée remains bimoraic; delinking, which would produce the monomoraic *tê, fails to apply. (Another possible account of the persistent bimoraicity of these forms will be given below in Section 3.)

We have seen that bimoraic nouns of the form CVV do not shorten. However, nouns that are underlyingly CCVV do undergo delinking:

(7) / ssóó / → ssó 'thwart of canoe'

/ pwpwoo / → pwpwo 'navigator'

/ kkáá / → kká 'taro sp.'

/ too / → tto 'clam sp.'

/ kkéé / → kké 'cry'

If we assume that initial geminates are indeed moraic, contributing a mora to the overall weight of the word, this provides a principled explanation for the difference in behavior of the examples in (6) and (7). As diagrammed in (8b), if Delinking were to apply to underlyingly bimoraic nouns, these words would be left with only a single mora, and they would fail to meet the two-mora quota. Nouns of the form CCVV, on the other hand (8a), are underlying trimoraic. They can sacrifice a mora to delinking while continuing to satisfy the bimoraic minimal requirement.

(8) a. / ttoo / → tto  

b. * / maa / → ma

If initial geminates were non-moraic, delinking would be predicted to be blocked in (7), just as with the bimoraic examples in (6). If we assume the forms in (7) to be trimoraic, then their fact of their delinking is predictable, given that, as shown in (2), other words that are trimoraic or longer do delink. This distinction in behavior with respect to Delinking offers strong support for the moraicity of initial geminates.

3. Compensatory Lengthening. Final Delinking in nouns sometimes triggers a process of Compensatory Lengthening. Preliminary data are given in (9).
The basic pattern is clear: with delinking of the word-final vowel, the vowel of the preceding syllable lengthens, "compensating" for the loss of the last vowel. The derivation of tiip illustrates the process:

(10) (i) Base Form (ii) Final Delinking (iii) Parasitic Delinking

After Parasitic Delinking of the final syllable node has left the final mora unassociated (iii), the vowel melody of the first syllable spreads (iv), associating to the floating mora. Note that this penultimate vowel is the only possible candidate for spreading. By the Relinking Condition, the final /a/ cannot re-link to the mora from which it has just been disassociated. Nor can the /p/ associate to the mora, since a singly-linked moraic consonant is never possible. Accordingly, the /i/ spreads, and then the /p/ is syllabified as a non-moraic coda (v), as in (4a) above, while the /a/ is stray-erased.

The real interest of compensatory lengthening for the present investigation lies in the fact not all nouns undergo the process. (11) gives examples of nouns which underlyingly contain three or more moras. In these cases, CL does not apply.

(11) / piseki / → pisek (*piseek) 'goods'
/sékúru / → sékúr (*sékúúr) 'back'
/téénú / → téen (*tééén) 'torch'
/ráání / → ráán (*rááán) 'day, daylight'
/nemeneme / → nemenem (*nemenem) 'authority'
/nikasafasafa / → nikasafasaf (*nikasafasaaf) 'tall swamp grass'
This generalization, that only those nouns that are underlying at least trimoraic fail to undergo CL, is confirmed by the evidence of compound words (12):

(12) /imwa/ → iimw (*imw) ‘house, building’
    /imwa+kkana/ → imwakkan (*imwakkaan) ‘nearby house’
    /ki+imwa+imwa/ → kiimweimw (*kiimweimw) ‘house on lee platform of canoe’
    /sapa/ → saap (*sap) ‘cheek, side of face’
    /féšapa/ → fésap (*féšapa) ‘four cheeks (esp. of fish)’
    /fitesapa/ → fitesap (*fitesapa) ‘how many cheeks (esp. of fish)’
    /ttiwesapa/ → ttiwesap (*ttiwesaap) ‘nine cheeks (esp. of fish)’

A form which in isolation is only bimoraic, like /sapa/, will undergo CL after delinking, becoming /saap/. However, once the root /sapa/ has been compounded with other morphemes, resulting in a lengthened form, CL no longer applies: féšapa becomes fésap, not *féšapa.

We can account for the distribution of CL - why it happens in some cases, but not in others - if we see as its application as a reflection of the principle that nouns must remain minimally bimoraic. Compensatory lengthening is a repair strategy which operates only when minimality is threatened. Thus, it applies only to those forms which are underlying bimoraic, the only class of nouns actually in danger of falling below the bimoraic minimum through delinking. When they are threatened with the loss of their final mora through final delinking, rather than allowing them to become monomoraic, CL acts to conserve mora count. In cases where the base is trimoraic or longer (11), CL does not apply, since at least two moras remain even after delinking, and minimality is not at risk. CL, then, does not blindly conserve mora count under all circumstances; rather it applies only when necessary to maintain minimality.

Let us take into consideration once more the case of nouns of the form CVV, given in (6) above. These forms surface unchanged, remaining CVV. Our previous claim was that Delinking was blocked in these cases by the need to maintain minimality. But it would seem equally valid to assume that Delinking does in fact apply, followed by CL, just as in bases of the form CVCV, and that the surface CVV forms are the result of the application of both processes.6

Given that CL is sensitive to the mora count of a word, we can use its application as a diagnostic, to determine whether the base has two moras (CL will apply) or three (CL will not apply). In the case where the base has the form CCVCV, this test will enable us to decide whether this form has two moras or three - that is, whether the initial geminate contributes moraic weight. As expected, such forms do not undergo CL (13).
The behavior of the forms in (9) and (13) is contrasted in (14). Since *tipa* is underlyingly bimoraic, it must preserve both moras through CL in order to remain bimoraic. But because the initial geminate supplies a mora, *ffesi* is underlyingly trimoraic, and has no need to resort to CL.

(14) a. / *tipa* / → *tiip*  b. / *ffesi* / → *ffes*

We have seen that the interaction of nouns with Delinking and Compensatory Lengthening is a function of the over-riding necessity of maintaining minimality. Other lexical categories, although always at least bimoraic underlyingly, are not constrained to remain bimoraic, and so behave differently with respect to these two processes. So, for example, non-nouns can become monomoraic through delinking (15):

(15) / *sáá* / → *sá* 'be removed'
 / *oo* / → *o* 'be caught'
 / *faa* / → *fa* 'be brave'
 / *kii* / → *ki* 'assemble'
 / *maa* / → *ma* 'be ashamed'

And, similarly, compensatory lengthening never takes place in lexical categories other than nouns (16):

(16) / *nuku* / → *nuk* (*nuuk) 'haul on a line'
 / *tupwu* / → *tupw* (*tuupw) 'go'
 / *chona* / → *chon* (*choon) 'gossip' (v.)
 / *ménú* / → *mén* (*méén) 'blow, be a wind'
 / *topwu* / → *topw* (*toopw) 'dull, gray'
 / *para* / → *par* (*paar) 'red'
 / *chékú* / → *chék* (*chéék) 'only'

For example, *nuku* 'haul on a line' becomes the monomoraic form *nuk* after delinking; it does not lengthen to *nuuk*. This confirms the view that compensatory
lengthening functions as a strategy for maintaining minimality. If it simply operated blindly to maintain overall mora count, we would expect it to apply uniformly to all words.

4. Gemination Throwback and the Representation of Initial Geminates. Verbs of the form CVCCV undergo a process called "Gemination Throwback" (Churchyard 1990a). When the final syllable is eliminated in the course of delinking, the medial geminate consonant is degeminated, and the initial consonant becomes geminate. Examples are given in (17):

(17)        /pekki/  \rightarrow  ppek  'shoot at (with a gun)'
            /peppa/  \rightarrow  peppe  'skip, bounce'
            /monna/  \rightarrow  mmon  'be prepared'
            /mwékkú/  \rightarrow  mwmwék  'be unable to walk'
            /mwúchchú/  \rightarrow  mwmwúch  'end, be finished'
            /mwóttó/  \rightarrow  mwmwót  'have a hollow, be cupped'
            /kútta/  \rightarrow  kkúút ~ kkúút  'search' (v.)
            /kuchchú/  \rightarrow  kkuch  'fit' (v.)

Modelling this process poses obvious problems for the representation of geminates we have been assuming so far. An attempted derivation, given in (18), makes the difficulties clear.

Once delinking (ii) and Parasitic Delinking of the syllable node (iii) have applied, the /k/ ceases to be a licensed coda consonant, since no moraic consonant can be singly-linked. Accordingly, the /k/ also delinks from its mora, leaving us in (iv) with two floating moras, but with no obvious means of achieving the desired result of associating one of them to the initial /p/. The only recourse would seem to be an ad-hoc destruction of the remaining syllable structure, followed by re-association across the board.

A resolution to the impasse has been proposed by Churchyard (1990a). He proposes a representation in which consonant and vowel moras are actually segregated on distinct tiers, as shown in (19):
This representation has the immediate technical advantage, as Churchyard points out, that it permits the modelling of gemination throwback, an apparently non-local phenomenon, as local - on the consonant mora tier. A derivation is given in (20).

Delinking and Parasitic Delinking take place; as before, the now-final /k/ degeminates (ii), and it leaves a mora floating on the consonant-mora tier (iii). This stranded mora can now simply associate to the only possible landing-site, the word-initial consonant (iv). (The mora cannot, of course, associate to the /k/, a possibility blocked both by the Relinking Condition and the prohibition on singly-linked moraic consonants.)

Another advantage of the multi-tiered representation is that it explains neatly why delinking leads to gemination throwback only in those cases where a medial consonant has become degeminated, but not in any other instance—these are the only cases in which a consonant mora has been made available for reassociation. Compensatory lengthening of a vowel, on the other hand, arises when delinking has led to a vowel mora being unassociated.

Since delinking plus degemination actually give rise to two floating moras, one on the consonant mora tier, one on the vowel mora tier, we might logically expect to find instances where a base CVCCV may undergo either compensatory lengthening or gemination throwback. Such cases are attested, as can be seen when we turn to the study of gemination throwback in nouns. The data are summarized in (21).
Some bases, like *tappa, 'green coconut', undergo CL, becoming *taap. Others, like *mūnnū, 'upper back' undergo GT, and *mmūn is the result. A very few nouns actually have documented variation between the two possibilities: underlying *tupwpwu emerges after delinking either as *tuwpw, with the vowel lengthened by CL, or as *tuwpw, with the initial consonant doubled by GT. Note first that the forms produced by GT are an additional piece of evidence in support of the moraicity of initial geminates. Given that these forms, like all nouns, must meet the bimoraic minimum, it is obvious that a noun of the form CVCCV can satisfy this requirement only if the initial geminate supplies a mora. In the unmarked case, bimoraic noun bases must undergo CL to maintain minimality after delinking. For noun bases of the form CVCCV, however, delinking makes two moras available: one on the consonant mora tier, one on the vowel mora tier. CVCCV bases thereby actually have two possible strategies open to them for maintaining minimality: compensatory lengthening or gemination throwback.7

Morphemes in Trukese are subject to the following constraint: No simplex morpheme in Trukese ever contains more than one geminate consonant. The morphemes in the (22a) are licit; those in (22b) are not, since they contain more than one geminate consonant.

<table>
<thead>
<tr>
<th>(21)</th>
<th>CVCCV</th>
<th>CL</th>
<th>GT</th>
</tr>
</thead>
<tbody>
<tr>
<td>/kúna, kuna/</td>
<td>kúun</td>
<td></td>
<td>kkúun</td>
</tr>
<tr>
<td>/mūnnū/</td>
<td>-----</td>
<td>mmūn</td>
<td>'upper back'</td>
</tr>
<tr>
<td>/tappa/</td>
<td>taap</td>
<td>----</td>
<td>'green coconut'</td>
</tr>
<tr>
<td>/wutta/</td>
<td>wuut</td>
<td>----</td>
<td>'meeting house'</td>
</tr>
<tr>
<td>/tupwpwu/</td>
<td>tuwpw</td>
<td>---</td>
<td>'shrub sp.'</td>
</tr>
<tr>
<td>/kupwpwa/</td>
<td>kuwpw</td>
<td>---</td>
<td>'flower pod of breadfruit'</td>
</tr>
<tr>
<td>/mwūchchū/</td>
<td>mwūch</td>
<td>mwmmwūch</td>
<td>'end, finish'</td>
</tr>
</tbody>
</table>

Words containing more than one geminate consonant do exist, certainly—but these are all compound words (23).

(23)   
nenenggaw    'be bad-tasting'
         (nne-, 'taste', + ngngaw, 'be bad')
ppēnūweffengen 'be even-numbered'
         (ppēnu, 'opposite', + ffengen 'toward one another')
ōrossūnggeni    'bump against'
       (ōör, 'side', + -ssúng, 'bump', + ngeni, 'against')

Long vowels, by contrast, freely co-occur with other long vowels and with geminate consonants (24):

(24)   
tuwmwuu       'dye'
koneetaa      'tree sp.'
fāannōō       'loom beam'
faakka       'light perspiration'
chuffanaa    'be lying'
mwmwaawa 'be) gentle'
ttu'una 'broil'

The representation utilizing separate moraic tiers is superior to previous representation from a purely technical point of view, in that it permits a principled account of the gemination throwback data. But the multi-tiered model also makes it possible to formalize this morpheme structure constraint quite simply:

\[
(25) \quad \text{Morpheme Structure Constraint: No morpheme ever contains more than one mora on the consonant-mora tier.}
\]

\[
*[ \ldots \mu \ldots \mu \ldots ]_{\text{Morpheme}} \quad \text{C-mora tier}
\]

5. **Conclusions.** Using evidence from Trukese, I have provided clear empirical support for the hypothesis that initial geminates are moraic. I have shown how initial geminates crucially assist in maintaining minimality by contributing toward the overall mora count of a word in their interaction with three prosodic processes: final delinking, compensatory lengthening, and gemination throwback.

A representation has been proposed, using separate consonant and vowel-mora tiers, which permits an account of the gemination throwback data and also facilitates the expression of a morpheme structure constraint. What remains an open question at this point is why these languages that have initial geminates, which are clearly a very highly-marked phenomenon, should also have separate consonant and vowel mora tiers, which is also presumably a highly marked option; there is no motivation for supposing that languages with medial but no initial geminates make use of multiple moraic tiers. The connection may be related to the onset-rime distinction. In the unmarked case, rimes can be defined as those elements which are dominated by moras; onsets are those which are not. In a language which allows an onset to be moraic - i.e., that allows initial geminates - the distinction is lost, or at least blurred. So it may be that putting the consonant and vowel moras on separate tiers, as in the case of Trukese, is in some sense the functional equivalent of the onset-rime distinction in other languages.

**Notes**

1. Although Hayes does not make it explicit, the initial mora, although originally extraprosodic, is presumably required, like any other prosodic element, to be prosodically licensed in the sense of Ito (1986) by being integrated into higher prosodic structure. We might assume that it simply adjoins to the syllable node.
2. Such syllables, apparently trimoraic, although somewhat marked, are not uncommon. Since no processes in Trukese are sensitive to syllable weight as such, however, they cannot be shown empirically to be 'superheavy'.
3. There are no complex onsets in the native vocabulary, but they occasionally occur in loan words: prismana, 'policeman' (Eng.).
4. Additional evidence supporting the moraic trochee as the foot type comes from a pattern of reduplication forming denominal verbs, which apparently maps to a suffixed bimoraic template: /wa'a/, 'canoe'; /waawaa/, 'use as a vehicle', but /mwaane/, 'brother'; /mwaaneane/, 'treat as a brother'.
5. Schein and Steriade (1986) explicitly allow the shortening of a geminate (p.716). In the skeletal framework they assume, however, this is regarded as deletion of a skeletal slot, rather than delinking from a prosodic element.
6. If we assume that surface CVV forms are the result of Delinking followed by CL, however, then we will need to say that the Relinking Condition is over-ridden in such cases, presumably by the need for a well-formed output.
7. It is admittedly unclear to what extent the CL~GT alternation is productive, and whether speakers would accept the unattested possibilities as valid alternatives. The choice of strategy - CL or GT - taken by a given form may well be lexicalized. Recent loan words mostly are documented as using CL: /sáāki/ --> sáāk 'jack' (in cards) (Eng.); although GT is at least a possibility: /makka/ --> mmak 'mark' (Eng.)

Appendix

Phonemic Inventory (in Trukese orthography; after Churchyard 1990a)

Consonants

<table>
<thead>
<tr>
<th></th>
<th>[-rnd]</th>
<th>[+rnd]</th>
</tr>
</thead>
<tbody>
<tr>
<td>stop.</td>
<td>p</td>
<td>pw</td>
</tr>
<tr>
<td>affric.</td>
<td>t</td>
<td>ch [č]</td>
</tr>
<tr>
<td>fric.</td>
<td>s</td>
<td>ng [ŋ]</td>
</tr>
<tr>
<td>nasal</td>
<td>m</td>
<td>mw</td>
</tr>
<tr>
<td>trill</td>
<td>n</td>
<td>r</td>
</tr>
<tr>
<td>glide</td>
<td>w</td>
<td>y</td>
</tr>
</tbody>
</table>

Vowels

<table>
<thead>
<tr>
<th></th>
<th>[-back] (+back) (+back)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[-md]</td>
<td>[-rnd] [+rnd]</td>
</tr>
<tr>
<td>high</td>
<td>i</td>
</tr>
<tr>
<td>mid</td>
<td>e [e]</td>
</tr>
<tr>
<td>low</td>
<td>á [æ]</td>
</tr>
</tbody>
</table>

References:

Churchyard, H.: 1990b, "Prosodic and Harmonic Phenomena in Puluwat, with Comparisons to Trukese", Ms., University of Texas at Austin.
Hayes, B.: 1989, "Compensatory Lengthening in Moraic Phonology", Linguistic
Inquiry 20:2, pp. 253-306.


The Effect of F0 Fall Rate on Accent Perception in English

Kazue Hata
Speech Technology Laboratory

Yoko Hasegawa
University of California, Berkeley

1. Introduction

Onishi (1942) points out that the function of accent is to differentiate the meaning, or to make prominent a portion, of words or phrases, and that accent is an impressionistic sum of any features that could serve these purposes. It has been widely recognized that in English four psychoacoustic dimensions influence the perception of accent (stress): pitch, length, loudness, and sound quality. In neutral declarative intonation, the accented syllables carry, relative to non-accented syllables, higher fundamental frequency (F0), longer duration, higher amplitude, and such different spectral patterns as in energy distribution among vowel formants.

Fry (1958) conducted perceptual experiments with synthetic noun-verb pairs in which the distinction is made by the accent placement, e.g. subject vs. subject. He found that the increase in vowel duration of the second syllable can cause a perceived accent shift from noun subject to verb subject. The increase in amplitude has a similar effect, although to a lesser magnitude. As for the ranking between F0 and duration cues, typically the former outweighs the latter. Therefore, in Fry’s experiment, the most significant cue to the accent was F0, followed by duration and then by amplitude.

Naturally, then, one may think that accent location is determined by the location of F0 peak. However, this is not always the case. The perceived accent and the actual F0 peak sometimes do not synchronize without listeners detecting this desynchronization (Lehiste and Peterson 1961, Neustupný 1966, Sugito 1972, Hasegawa and Hata 1988, Hata and Hasegawa 1988). In Japanese, for example, the listener perceives an accent on a syllable even when the F0 peak does not occur on it. In Hasegawa and Hata (1988), we presented the following pair from our production data. They are part of the word namida ‘tear’, in which the lexical accent falls on the first syllable. In the figure on the right, the F0 peak is clearly on /l/, and yet the word was perceived as /námida/.

![Figure 1: F0 contours for the word /námida/](image-url)
Sugito (1972) found that this illusory accent is due to the F0 contour falling after the peak: if the peak is followed by a steep F0 fall, the listener perceives an accent on the preceding syllable, as shown in Figure 2.²

![Figure 2: Perceived accent and the actual F0 peak](image)

This phenomenon of illusory accent explains why the native Japanese listener perceives an accent on a devoiced vowel. Even though high F0 does not occur on the devoiced vowel, the F0 fall on the following syllable forces the listener to associate an accent with that vowel.

Hata and Hasegawa (1988) found that there is a positive correlation between the F0 peak location and the F0 fall rate immediately after the peak in those utterances where the perceived accent was shifted from the location signaled by the F0 peak. The later the F0 peak occurred in the second syllable, relative to the syllable boundary, the greater the fall rate necessary for the listener to associate the accent with the first syllable. For example, when the F0 peak was at about 50% of the second syllable, the majority of the subjects judged the first syllable to be accented even when the fall rate was as small as 4 Hz/csec; whereas, when the peak was at about two-thirds into the second syllable, a rate of 8 Hz/csec or greater was necessary for the same judgment.

![Figure 3: F0 peak location and F0 fall rate](image)
The present study investigates whether or not the effect of F0 fall rate is observed in accent perception of English. The focus of English utterance, if there is any, is often expressed by placing the so-called contrastive accent on a certain syllable within the focused constituent (cf. Bolinger 1954, 1961, Halliday 1967, Chafe 1976, Lambrecht 1986). For example, the contrastive accent would be on my in "This is my net" if one were to answer the question "Is this her net?" On the other hand, in neutral (unmarked) intonation, e.g. responding to "What's this?", the nuclear accent occurs on the last syllable, net. Due to the coupling with final lowering, the fall rate must be greater if the nuclear accent is on the final syllable than elsewhere in the utterance (Mattingly 1968, Olive 1974, Maeda 1976). Thus, utterances with this condition are likely candidates in English for observation of the effect of F0 fall rate, if it should occur.

2. Perceptual Experiment

2.1 Method
Using a MITalk-based system, we synthesized ten variations of the English utterance, "This is my net", with different F0 fall rates on net. The duration and amplitude of each syllable were kept constant across the utterance-stimuli, and the F0 peak always occurred at the onset of /e/ in net. The F0 contour of the utterances started at 121 Hz, linearly rose to 150 Hz at the onset of /e/ in net, and ended at 102 Hz. The difference between the peak and the end was 48 Hz, and the duration of the fall was varied from 2 csec (= 20 msec) to 11 csec by a 1-csec step. The fall rate of each stimulus is shown in the following table.

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Rate (Hz/csec)</th>
<th>Stimulus</th>
<th>Rate (Hz/csec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>4.8</td>
<td>7</td>
<td>9.6</td>
</tr>
<tr>
<td>3</td>
<td>5.3</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>6.9</td>
<td>10</td>
<td>24</td>
</tr>
</tbody>
</table>

Table 1: F0 fall rates of stimuli

Figure 4 illustrates the F0 contour, the duration, and the amplitude envelope of each segment of sample stimuli (1 and 10).

Thirty-four native speakers of American English participated in the experiment. First, they listened to the experiment instructions in synthetic speech in order to familiarize themselves with the synthetic voice. Then, the subjects were asked to judge whether each utterance was more appropriate to responding to "What's this?" (inducing the accent on net in "This is my net") or to "Is this her net?" (inducing the accent on my). Hereafter, the former will be referred to as net-response, and the latter as my-response. Each subject listened to two sets of the 10 stimuli which were randomized in different orders.
2.2 Results and Discussion
Because subjects' responses were occasionally arbitrary, we counted only consistent judgments (i.e. the same judgment on both sets); the results are summarized in the following table. The first column indicates the fall rate, and the second indicates the percentage of consistent judgments (the number of subjects appears in parentheses); the third and fourth columns indicate the percentage of the net- and my-responses, respectively, against the total number of consistent judgments.4.

<table>
<thead>
<tr>
<th>Rate (Hz/csec)</th>
<th>Consistent judgements</th>
<th>net-responses</th>
<th>my-responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4</td>
<td>91% (31)</td>
<td>97% (30)</td>
<td>3% (1)</td>
</tr>
<tr>
<td>4.8</td>
<td>79% (27)</td>
<td>96% (26)</td>
<td>4% (1)</td>
</tr>
<tr>
<td>5.3</td>
<td>79% (27)</td>
<td>96% (26)</td>
<td>4% (1)</td>
</tr>
<tr>
<td>6</td>
<td>74% (25)</td>
<td>84% (21)</td>
<td>16% (4)</td>
</tr>
<tr>
<td>6.9</td>
<td>65% (22)</td>
<td>73% (16)</td>
<td>27% (6)</td>
</tr>
<tr>
<td>8</td>
<td>59% (19)</td>
<td>79% (15)</td>
<td>21% (4)</td>
</tr>
<tr>
<td>9.6</td>
<td>62% (21)</td>
<td>52% (11)</td>
<td>48% (10)</td>
</tr>
<tr>
<td>12</td>
<td>71% (24)</td>
<td>50% (12)</td>
<td>50% (12)</td>
</tr>
<tr>
<td>16</td>
<td>71% (24)</td>
<td>33% (8)</td>
<td>67% (16)</td>
</tr>
<tr>
<td>24</td>
<td>79% (27)</td>
<td>41% (11)</td>
<td>59% (16)</td>
</tr>
</tbody>
</table>

Table 2: Comparison of the net- and my-responses
As shown in the second column, the consistency of subjects' judgments is highest at the two extreme fall rates: 91% when the rate is smallest (4.4 Hz/csec), and 79% when it is greatest (24 Hz/csec). The farther away the fall rate is from these two extremes, the fewer the consistent judgments. This fact indicates that if the F0 fall rate is significantly small or great, the listener can determine the location of accent consistently from F0 information alone, but if the rate is close to 8 Hz/csec, the F0 by itself is ambiguous as a cue to the accent location.

The third and fourth columns of the table show that there is asymmetry between the two judgments with greater and smaller fall rates. At 4.4 Hz/csec, 97% of the consistent judgments are net-responses. In contrast, at 24 Hz/csec, the subjects' judgments split between net-and my-responses. This implies that if the rate is small, the accent is perceived on the syllable where the actual F0 peak occurs, but if the rate is great, the accent is likely, but not necessarily, to be perceived on the preceding syllable.

Figure 5 plots the percentage of the responses with respect to the total number of consistent judgments. The general tendency for the greater fall rate to shift the perceived accent observed in this study is in accordance with the results of our previous experiments with Japanese accent. However, the proportion of the perceptual shift is smaller in English than in Japanese: the maximum percentage of the shift is close to 100% in Japanese, whereas it is only 67% (at 16 Hz/csec) in this experiment.5.

![Figure 5: Identification of nét and my in percent](image-url)
In order to account for this difference, it is necessary to compare the prosodic structures of these two languages. Unlike Japanese, in which F0 is by far the most prominent indicator of accent (Weitzman 1969, Bechman 1986), English makes use of four orthogonal acoustic cues: F0, duration, amplitude, and spectral patterns. Generally, the most prominent indicator is F0, then duration, and then amplitude, as is reported by Fry. However, the ranking varies significantly among native listeners (Beckman 1986) as well as among the syntactic structures where the word in question appears (Nakatani and Aston 1978). It seems that accent is an impressionistic sum of cues, as Onishi claims, but the method of the summation is not uniform. Some native speakers of English have difficulty in detecting Japanese accent, which generally does not accompany longer duration nor higher amplitude.

In the present experiment, two subjects (of 34) never exhibited a shift of the perceived accent. It may be that F0 is a lower-ranking cue for these subjects, and therefore, perhaps it might have been more appropriate to exclude them from the data. However, because we have no evidence for their internalized ranking, we included these subjects in the analysis.

It is also necessary to point out the fact that the net-response is unmarked, whereas the my-response is highly marked; i.e., net is the neutral location to place the nuclear accent in the utterances without a special focus. Many subjects commented after the experiment that some stimuli were not as natural as they should be for "This is my net" but that they nevertheless gave a net-response because the accent they perceived on my was not sufficient to carry a contrastive accent. Furthermore, in order to avoid the use of undefined notion accent, we selected pragmatic differences to distinguish two accentual patterns. This methodology placed an extra burden on some subjects, who claimed that the task was extremely difficult. They were not accustomed to thinking of the question to which a given utterance is appropriate. Therefore, if the subjects' task had been to judge the naturalness of utterances with the nuclear accent on net, the percentage of the net-response would have been much lower than the present results.

Taking into consideration these factors, we conclude that the shift of the perceived accent is observable in English. Similar to native Japanese listeners, native English listeners utilize the F0 peak location and the F0 fall rate as cues to determine the location of accent.

3. Implications

Understanding how the listener determines the place of accent is crucial in two areas: sound change and speech synthesis.

3.1 Sound change

Ohala (1981, 1983) claims that those sound changes attested in similar form in diverse languages result from errors of transmission of pronunciation from one speaker to another. The preconditions of such sound changes are some universal physical or physiological constraints which occur in present-day speech and are therefore available for investigation. For example, the change of labialized velars to labials is very common, but not vice versa. It has also been reported that the identification errors of /k/ as /p/ is much greater than /p/ as /k/ (Winitz et al. 1972). The representation of these sounds as velars and labials obscures the potential causes of the asymmetry in historical sound change and in the confusion matrices. We must know what we represent by these terms.
Like segmentals, suprasegmentals do change in the course of time. A language may lose an original quantity opposition, e.g. vowel length, or it may develop a new one. A language may lose or acquire distinctive tone: a formerly free and nondistinctive tone may become fixed and acquire the value of a boundary signal (Jeffers and Lehisite 1982).

In the case of Japanese accent, McCawley (1968) reports that the accent system of two syllable words in the Tokyo type dialect is likely to develop from the proto form by shifting accent one syllable to the right. Understanding how a high tone is perceived makes this claim very plausible. If the F0 peak occurred on the post-accent syllable, and the fall rate were not great enough, the accent would be perceived on that syllable. In Ohala's theory, this is a seed of sound change. Whether or not this change would spread must be accounted for in the sociolinguistic domain.

3.2 Speech synthesis

In synthesizing English utterances, the placement of the F0 peak of the nuclear accent continues to be controversial. Ashby (1978) claims that the nuclear accent occurs at a fixed location in the vowel regardless of the vowel length, whereas Steele (1986) claims that the peak location should vary according to the vowel duration. Furthermore, Pierrehumbert (1981) and Silverman (1987) report that the F0 peak location varies between the nuclear accent and other prenuclear accents. Their F0 algorithms for synthesizing English intonation place the peak earlier in the nuclear accent than in prenuclear accents.

Although Olive (1974) mentions that the fall rate of the nuclear accent must be greater than that of prenuclear accents, no study, to our knowledge, has considered the relationship between the peak location and the fall rate. Because the effect of F0 fall rate on accent perception is found in English, elaborated speech synthesizers of English utterances should take this relationship into consideration.

Let us reexamine the results in Table 2. Given the peak at the vowel onset in net and the 6.9 Hz/csec fall rate, 73% of the consistent judgments were net-responds. However, if we consider the total number of judgments, rather than the consistent judgments, less than half of the subjects (16 out of 34) perceived the accent on net. This indicates that, as the fall rate increases, approximately 7 Hz/csec is where F0 by itself ceases being a reliable cue to accent location. Moreover, if the rate is greater than 12 Hz/csec, other acoustic cues (i.e. longer duration, higher amplitude, and different spectral patterns) may compete against the F0 cue for those who rely heavily on F0 in determining accent. We, therefore, suggest that in order to avoid the effect of F0 fall on English accent perception, the fall rate should not exceed 12 Hz/csec when the peak location is at the onset of the vowel of the syllable which carries the nuclear accent.

4. Conclusion

In the present study, we found that English also manifests the effect of F0 fall rate on accent perception observed in Japanese. The results show that manipulating the fall rate alone can cause a perceived accent to be shifted in English utterances. Because English provides other acoustic cues in addition to F0, the occurrence of the perceptual accent shift is less frequent than in Japanese.

Accent and intonation, however they are defined, are essential parts of language. It is extremely difficult for non-native speakers to acquire normal
accentual patterns. One reason is that the composition of accent is complex and language-specific even though the components are chosen from the pool of features which are available universally. Therefore, those components which play a significant role in accent placement must be stated explicitly in the description of languages.

Notes

1 An earlier version of this paper was presented at the 120th Meeting of the Acoustical Society of America, November 26-30, 1990, San Diego, California. We would like to thank the following individuals for comments on various stages of this work: Michelle Caisse, John Cherry, Carlos Gussenhoven, Michael O'Mailly, John Ohala, Raymond Weitzman, and Helen Wheeler.

2 Fujisaki et al. (1976) have suggested that the desynchronization of the F0 peak and the syllable boundary in acoustic data is not psychologically real but a mere reflection of different processing time between detecting F0 changes and segmental boundaries. Detecting F0 changes is faster than detecting segmental boundaries, and thus, they synchronize in perception. Javkin (1976), and Maddieson (1976) conducted experiments to determine when F0 changes and segmental boundaries are recognized, but their results do not provide conclusive evidence for this hypothesis.

3 The fall rates which we calculated from the F0 data of English utterances in Maeda (1976) show that they are greater in sentence-final position (10.2-14.5 Hz/csec) than in other positions (8.4-13.3 Hz/csec).

4 The result of a chi-square test shows that the differences between my- and net-responses are significant at the 1% level.

5 Michael O'Mailly pointed out that the relatively high percentage of net-response at 24 Hz/csec might be due to the defect of the stimulus, i.e. the stimulus might not have the fall rate of 24 Hz/csec (emwhich frequently is the case with synthesizers based on certain algorithms. We rechecked the the F0 fall rates of the all stimuli, and confirmed the accuracy of their fall rates.

References


Maddieson, I. 1976. Tone spreading and perception. JASA Suppl.1.60, S45.
Ohala, J.J. 1981. The listener as a source of sound change. CLS 17, 178-203.
Steel, S.A. 1986. Nuclear accent F0 peak location: effects of rate, vowel and number of following syllables. JASA Suppl.1.80, S51.
The Passive Construction and Case in Korean*

Ki-Sun Hong  
Stanford University

0. Introduction

The purpose of this paper is twofold: one is to isolate the primary semantic factor which distinguishes two kinds of Korean passive, and the other is to show that different case marking patterns in the two constructions directly follow from this semantic difference.

The lexical passive is formed by -i/hi/li/ki affixation (henceforth, HI passive), and the phrasal one is formed by the ci auxiliary (henceforth, CI passive), as in (1-2). They exhibit an interesting contrast in case marking: complements (e.g., 'hand') are marked either nominative (NOM) or accusative (ACC) in the former, but only nominative (NOM) in the latter (Kang 1986, Gerdts 1986, Maling 1989, Y. Kim 1990, among others). This raises a problem, as only one pattern would be generally expected.

nom dat hand-nom catch-HI-past-indicative
'John's hand was caught by Mary.'

acc

nom by hand-nom catch CI-past-indicative

b.*John-i Mary-eyuihaye son-ul capa ci-ess-ta.    
acc

First, I will review Y. Kim's approach (1990) to this problem. Second, I will introduce the semantic notion of a determinant, which I will argue to be relevant to the nominative/accusative case alternation in Korean. Third, I will argue that this notion distinguishes the HI passive and the CI passive. Last, it will be observed that distinct case patterns in the two constructions result from the semantic difference. Along the way, we will observe that this semantic distinction also accounts for other related facts.


Y. Kim (1990) proposes case marking rules in Korean which dictate that ACC is assigned to verbal arguments by [+agentive] predicates, projecting an external argument. A [+agentive] predicate has a DO or a CAUSE clause in its Lexical-Conceptual Structure (Jackendoff 1987). Her proposal accounts for the case marking of the CI passive, as in (2). Passive predicates lack the highest DO or CAUSE clause, and thereby, are [-agentive] and cannot project an external argument; hence, no ACC marked complement is sanctioned. HI passive predicates raise a problem for her approach, since they lack the highest DO or CAUSE clause, and thereby, do not project an external argument, but can assign ACC, as (1b) demonstrates. To explain (1b), Y. Kim (1990;217) distinguishes two kinds of complex verbs: one consists of "$V_{stem}+V$" (e.g., CI passive form), and the other is "$V_{stem}+affix" (e.g., HI passive form). And in the second case, the [+agentive]
feature of the verb stem percolates up, and makes the whole verb an ACC assigner. For (1a) which has a NOM marked complement, she relies on a structural difference. The 'hand' in this case is an adjunct, which cannot be assigned ACC; hence, NOM by default. In so doing, Y. Kim has to modify her original proposal that a verb's projection of external argument and its case marking ability always go together (see Burzio's generalization, Burzio 1986:178).

This proposal accounts for the given facts, but leaves some problems. First, Korean has a lexical causative construction which is also formed by -i/hi/li/ki affixation like HI passive, as in (3).

(3) a.*John-i mul-i el-ii-ess-ta.
    nom  water-nom be frozen-causative-past-indicative
    'John froze the water.'

    acc

In (3), the 'water' must be marked only with ACC. When we consider that the whole causative verb (i.e., elli- 'freeze') is [+agentive], and the verb stem (i.e., el- 'be frozen') is not, this case marking indicates that the case assignment is determined by the whole verb, not by the verb stem, as claimed by Y. Kim. Then, it needs to be explained why the [+agentive] feature of the stem cannot percolate up, that is, why only the [+agentive] feature has such a privilege. This leads us to a more fundamental question. The HI passive is the only case which requires a special interpretation of her theory in Korean grammar. To resort to such a stipulation on one kind of passive is an ironic result, since it is naturally expected that the passive construction (i.e., which suppresses the agent) should provide crucial evidence for such a proposal, expressed in terms of [+agentivity]. Second, it is still disputable whether (1a) and (1b) really have different structures, especially considering the counter-evidence proposed by Yoon (1990) and Maling and S. Kim (1990).

In the next section, I will propose the semantic notion of a determinant, which I will argue to provide a more unified account for the given data and for some related facts which have been considered unrelated (Y. Kim 1990).

2. Determinant and Case

A "determinant"¹ is defined as "one who can determine whether to bring about the sententially denoted situation or not", and therefore, "one who is in control of the situation" (for similar notions, see C. Lee 1973, Fodor 1974, Givon 1975, K. Lee 1987, Klaiman 1988, Farkas 1988, Kroeger 1990, among others). This definition addresses heterogenous entities: one who is volitional, sentient, causing an event, or mobile (see Dowty 1988). These are independent characteristics, but all of them share the ability of determining a situation.² For instance, when a running car hits me, the car is a determinant. But when I am walking and bumped onto a car which is parked, I am responsible for the event. A potential determinant is one who is compatible with being a determinant, in other words, one who can exert control over the situation if one chose, although one does not in the actual situation denoted by the predicate.³

There are some tests to pick out a determinant, including those suggested by Farkas (1988) and Y. Kim (1990). First, it may cooccur with such adverbs as
ilpule 'on purpose', uitocekulo 'intentionally', capalcekulo 'voluntarily'. Second, it may co-occur with -lyeko 'in order to' rationale clauses, since only a determinant can plan to bring about a situation in order to satisfy his own purpose. Third, a determinant may be the subject of such a predicate as hwuhoiha- 'repent', as we repent only what we are responsible for. Fourth, it may be the addressee in the sentences of the imperative or propositive mood. This is based on conversational implicature. It is not felicitous to order or propose to somebody to do something in the situation where they do not have any control. Fifth, it may be the causee of a coercive (e.g., sikhi 'force') or a manipulative predicate (e.g., seltukha 'persuade'), based on the same reasoning. Pragmatically, we can force or persuade somebody to do something, only when they are capable of it. Last, the determinant can be the subject of equi control predicates (e.g., ha 'try', nolyekha 'endeavor', sitoha 'attempt'), as it does not make any sense to try to do something when we are not in control.4

The notion of a determinant is related to animacy. First, due to its definition, an inert thing is hardly ever interpreted as a determinant (except as a causer in lexical causative sentences), compared to an animate being or a mobile thing. Second, Korean seems to have a preference condition which requires that a subject denoting an animate being or a mobile thing should not be interpreted as being controlled by some other determinant. We will see shortly that this condition is necessary to account for some CI passive sentences.

Hong (1991) argues that the semantic notion of a determinant is relevant to the NOM/ACC case alternation. Korean has two kinds of dyadic predicates denoting psychological process: one assigning ACC to its object, and the other assigning NOM, as (4) demonstrates.

   nom acc like-indicative
   'John likes Mary.'

   nom nom be likable-indicative
   '(lit.) Mary is likable to John.'

Although the subjects of both predicates bear the experiencer thematic role, they are distinguished in the determinant relationship: the subject of (4a) is a potential determinant, whereas that of (4b) is not, as (5-6) demonstrate. In other words, John can bring about the situation expressed in (4a), whereas he does not have any control over the situation in (4b).

   nom intentionally acc like-indicative
   '(lit.) John intentionally likes Mary.'

   nom the event-acc forget-in order to acc like-indicative
   '(lit.) John likes Mary, in order to erase the event from the memory.'

      acc like-adjectival fact-acc repent-indicative
      'John repents that he has liked Mary.'
d. Mary-lul cohaha-yela.
   acc like-imperative
'(lit.) Like Mary.'

   I-nom dat acc like-to force-past-indicative
'(lit.) I forced John to like Mary.'

   nom acc like-to try-indicative
'John tries to like Mary.'

    nom intentionally nom be likable-indicative

    nom the event-acc forget-in order to nom be likable-indicative

c. *John-i [Mary-ka cohu-n]
    nom nom be likable-adjectival fact-acc repent-indicative

   kes-ul hwuhoiha-nta.

d. *Mary-ka cohu-la.
   nom be likable-indicative

      I-nom dat nom be likable-to force-past-indicative

   nom nom be likable-to try-indicative

Based on this observation, I have proposed that the ACC marked object is sanctioned only when the predicate selects for a subject which denotes a potential determinant. NOM is given by default (Kang 1986, Y. Kim 1990). This rule is, in fact, applicable not only to objects but any complement of the predicate, as we will see shortly. So the rule is generalized as in (7).

(7) Case marking rules in terms of a determinant:
   a. Accusative marked complements are sanctioned, only when there is a potential determinant argument which is "syntactically expressed (i.e., not suppressed (demoted))". Nominative case is given by default.
   b. An inert thing is hardly ever interpreted as a determinant. It is preferred that the subject denoting an animate being or a mobile thing should not be interpreted as being controlled by some other determinant.

In the next section, we will observe that the notion of a determinant explains a semantic difference between the two kinds of passives (K. Lee 1987, Klaiman 1988).
3. Two Kinds of Passive Constructions

Let us first consider the HI passive. In each pair of (8-9), (a) shows an active sentence, and (b), a corresponding HI passive sentence.

    policeman-nom acc catch-past-indicative
    'The policeman caught John.'

        nom policeman-dat catch-HI-past-indicative
    (i) 'John got himself caught by the policeman.'
    (ii) 'John was caught by the policeman.'

    dog-nom acc bite-past-indicative
    'A dog bit John.'

        nom dog-dat bite-HI-past-indicative
    (i) 'John got himself bitten by a dog.'
    (ii) 'John was bitten by a dog.'

In an active sentence such as (8a), 'the policeman' is clearly a potential determinant of the situation, and passes all of our tests as in (10). In comparison, in the corresponding HI passive sentence (8b), 'the policeman' is not interpreted as a determinant, as (11) shows. Instead, (8b) is ambiguous: in one reading, 'John' is a potential determinant who may intentionally bring about the situation (ex. (12)), and in the other, there is no determinant in the situation: hence the sentence says that such a situation just happens. The same account applies to (9). In either reading, what is important is that the demoted agent is not a determinant: so the precise English translation is, in fact, unavailable. Also in many cases, the HI passive is interpreted more like a middle construction, by having a non-determinant agent, as is expected under my proposal.

(10) a. swunkyeng-i uitocekulo John-ul cap-ass-ta.
    intentionally
    'The policeman caught John intentionally.'

        inspection-acc make-in order to
    'The policeman caught John, in order to make an inspection.'

        adjectival fact-acc repent-indicative
    'The policeman repents that he caught John.'

    d. John-ul capa-la.
        imperative
    'Catch John.'

f. swunkyeng-i John-ul capu-lyeko ha-nta. to try-indicative 'The policeman tries to catch John.'

(11) a.*John-i uitocekulo swunkyeng-eykey cap-hi-ess-ta. nom intentionally policeman-dat catch-HI-past-indicative 'John was caught by the policeman intentionally (the policeman's).' 

b.*John-i swunkyeng-eykey [cosa-lul ha-lyeko] cap-hi-ess-ta. inspection-acc make-in order to 'John was caught by the policeman, in order to make an inspection.'

(12) a. John-i uitocekulo swunkyeng-eykey cap-hi-ess-ta. nom intentionally policeman-dat catch-HI-past-indicative 'John was caught by the policeman intentionally (John's).'

b. John-i [Mary-lul kвуha-lyeko] swunkyeng-eykey cap-hi-ess-ta. acc save-in order to 'John was caught by the policeman, in order to save Mary.'

c. John-i [swunkyeng-eykey cap-hi-n] kes-ul hwuhoiha-nta. adjetival fact-acc repent-indicative 'John repents that he was caught by the policeman.'

d. swunkyeng-eykey cap-hi-ela. imperative 'Be caught by the policeman.'

e. nay-ka John-eykey [swunkyeng-eykey cap-hi-key] sikhi-ess-ta. I-nom dat policeman-dat catch-HI-comp force-past-ind. 'I forced John to be caught by the policeman.'

f. John-i swunkyeng-eykey cap-hi-lyeko ha-nta. to try-indicative 'John tries to be caught by the policeman.'

Next, (13-14) exemplify CI passive sentences.


b. chayksang-i John-eyuihaye mantule ci-ess-ta. desk-nom by make CI-past-indicative 'A desk was made by John.'
    'John threw a ball.'

    b. kong-i John-eyuihaye tencie ci-ess-ta. ball-nom by throw CI-past-indicative
    'A ball was thrown by John.'

Unlike the HI passive, (15) demonstrates that the suppressed agent is interpreted as a potential determinant. Thus, the CI passive means that a sententially denoted situation may be intentionally brought about by the suppressed agent, and the subject cannot exert any power over the situation.

(15) a. chayksang-i John-eyuihaye uitocekulo mantule ci-ess-ta. desk-nom by intentionally make CI-past-indicative
    'A desk was made by John intentionally.'

    b. chayksang-i John-eyuihaye [sikthak-ulo ssu-lyeko] mantule
desk-nom by dining table-as use-in order to make
    ci-ess-ta. CI-past-indicative
    'A desk was made by John, in order to use it for a dining table.'

In sum, the CI passive construction has a non-determinant subject, whereas the HI passive construction either has a determinant subject or no determinant at all.7

4. Passive and Case

If our distinction of the two passive constructions in terms of a determinant is correct, we can predict various case facts as in (16), based on (7).

(16) a. Either ACC or NOM will be possible in the HI passive, which is ambiguous, due to (7a).

b. The CI passive can never have ACC marked complements due to (7a), as it does not have any determinant argument which is syntactically expressed: the agent is the only determinant, but it is suppressed.

c. Even in the HI passive, no ACC marking will be possible with a subject denoting an inert thing, due to (7b) which dictates that an inert thing is hardly ever interpreted as a determinant.

d. CI passive sentences will sound awkward with subjects denoting animate beings, due to (7b).8

All of these predictions are borne out. First, with such dyadic predicates as catch, tear, there is nothing much to say; the only syntactically expressed argument is marked NOM by default, in either passive construction. (17c), a CI passive with the subject denoting an animate being, sounds awkward as we predicted in (16d). In contrast, (18c), a CI passive with an inert subject, is perfect, as it does not violate (7b).
    nom acc catch-past-indicative
    ‘John caught Mary.’

        nom dat catch-HI-past-indicative
        ‘Mary was caught by John.’

        nom by catch CI-past-indicative

    nom the book-acc tear-past-indicative
    ‘John tore the book.’

        the book-nom dat tear-HI-past-indicative
        ‘The book was torn by John.’

        the book-nom by tear CI-past-indicative

Differences emerge when we consider dyadic predicates with adjuncts. In Korean, an adjunct agrees in case with an argument, when a whole-part relationship holds between the two (Y. Kim 1990, among others). Following Yoon (1990) and Maling and S. Kim (1990), I simply assume that the real arguments of the verbs in (19) are ‘the hand, the title page’, while ‘Mary, the book’ are adjuncts.

    nom acc hand-acc catch-past-indicative
    ‘John caught Mary by the hand.’

        nom the book-acc title page-acc tear-past-indicative
        ‘John tore the title page of the book.’

First, let us consider the two kinds of passives of (19a). As mentioned above, the HI passive is ambiguous. When the subject, Mary, is interpreted as a determinant, it sanctions ACC marking on the complement, as in (20a). In the other reading in which nothing is a determinant, no ACC marking is possible; hence NOM by default, as in (20b). In the CI passive (ex. (21)), the suppressed agent, but not the grammatical subject, is a determinant. Thus, no ACC marked complement is allowed in this construction, as predicted in (16b).

    nom dat hand-acc catch-HI-past-indicative
    ‘Mary was caught by the hand by John.’

        nom
nom by hand-acc catch CI-past-indicative   
   nom

Second, let us consider passives of (19b), which has an inert subject. The same account applies to the CI passive, shown in (23): its subject is not a determinant, so there can be no ACC marking, as (23a) demonstrates. With the HI passive, we find one difference from (20): a subject denoting an inert thing cannot sanction ACC marked complements, as in (22a). It is exactly as we predict in (16c): inert things are hardly ever interpreted as a determinant in Korean.

(22) a.*ku chayk-i John-eykey phyoci-lul ccic-ki-ess-ta.  
the book-nom dat title page-acc tear-HI-past-indicative  
' The title page of the book was torn by John.'   
   nom
the book-nom by title page-acc tear CI-past-indicative   
   nom

We get the same result, even in a construction with multiple adjuncts, as in (24). Either ACC or NOM marking is possible in the HI passive as in (25), due to its semantic ambiguity. In contrast, in the CI passive, only NOM marking is possible, as in (26).

nom acc hand-acc right one-acc finger-acc catch-past-indicative  
'John caught Mary by the fingers of the right hand.'

nom dat hand-acc right one-acc finger-acc catch-HI-past-indicative  
'Mary was caught by the fingers of the right hand by John.'   
   nom nom nom
(26) a.*Mary-ka John-eyuihayeye son-ul oluncckok-ul sonkalak-ul  
capa ci-ess-ta.  
catch CI-past-indicative
   nom nom nom
Let us move onto triadic predicates, as exemplified in (27).

    nom from money-acc take away-past-indicative
    'John took away money from Mary.'

    nom dat money-acc take away-HI-past-indicative
    'Mary's money was taken away by John.'

    nom

(29a).*Mary-ka John-eyuihayi ton-ul ppayas ci-ess-ta.
    nom by money-acc take away CI-past-indicative

    nom

As repeatedly shown, the CI passive allows no ACC marked complement, as in (29a). (29b) sounds awkward, due to (7b). With the HI passive, either ACC or NOM should be grammatical, but the latter (ex. (28b)) evades our prediction. I do not have any explanation for this now. My speculation is that these specific predicates should always select for a determinative subject, considering that they cannot have subjects denoting inert things.

Only the CI passive is possible with cwu- 'give'. When the goal argument, Mary, takes a dative argument as in (30b), there is only one possibility: the only syntactically expressed argument (i.e., 'the book') is marked NOM by default. When both 'Mary' and 'the book' are marked ACC in (31a), the corresponding passive sentence is not (31b) with ACC on 'the book', but (31c) with NOM, as predicted in (16b). (31c) sounds awkward due to (7b), which generally prohibits a subject denoting an animate being in a CI passive sentence.

(30a) John-i Mary-eykey chayk-ul cwu-ess-ta.
    nom dat book-acc give-past-indicative
    'John gave a book to Mary.'

    book-nom by dat give CI-past-indicative
    'A book was given to Mary.'

    nom acc book-acc give-past-indicative
    'John gave Mary a book.'

    nom by book-acc give CI-past-indicative
    'Mary was given a book.'

c.?Mary-ka John-eyuihayi chayk-i cwue ci-ess-ta.
    nom
Now, we can easily predict what will happen in a triadic predicate with a subject denoting an inert thing, as in (32a). Like (31b), (32b) will be ruled out, since no ACC marking is possible in the CI passive. However, unlike (31c), (32c) will be perfect, since it does not violate (7b).

    nom the table-acc table cloth-acc cover-past-indicative
    'John covered the table with the table cloth.'

    the table-nom by table cloth-acc cover CI-past-indicative
    'The table was covered with the table cloth by John.'

    the table-nom by table cloth-nom cover CI-past-indicative

One last observation deserves a word. The suppressed agent is marked by eykey 'DAT' in the HI passive, and eyuihaye 'by' in the CI passive. I think that this is also relevant to the semantic notion of a determinant. DAT marks an agent which is a non-determinant, whereas 'by' marks one which is a potential determinant. That is why they show roughly complementary distribution (K. Lee 1987). Also it is preferred that the host of 'by' should denote an animate being, due to (7b).

5. Conclusion

In this paper, I have attempted to show that there is a primary semantic factor which distinguishes HI passives and CI passives, and that their distinct case patterns directly follow from this semantic difference.

Notes

*I am grateful to Joan Bresnan and Peter Sells for their valuable discussions and comments. I have also received valuable suggestions from Joan Maling, Jeong-Woon Park, and Tae-Hwa Yoon.

1. The two available notions which are closest to a determinant are the "responsibility relation" (Farkas 1988:36) and "control" (Dixon 1979). I do not adopt the first one, since I, unlike Farkas, do not consider that a determinant is always an initiator. I avoid using the second one, since it has been associated with only an actual determinant or a volitional entity in many works.

2. Hong (1991) demonstrates that a determinant is distinguished from the agentive thematic role.

3. In most cases, we can figure out which one is the "potential determinant" by using the tests. For instance, John is uncontroversially a determinant in a specific situation of (1a), when it is clearly marked by such an adverb as 'intentionally' which is one of our tests. When there is no such explicit marking as in (1b), we can apply our tests, as what will be done throughout this paper: if they work, John is a "potential determinant".

    nom intentionally leave-past-indicative
    'John intentionally left.'
This way of interpretation does not work in such cases which have explicit expressions which are incompatible with any of our tests. 'Accidentally' or a specific modality marker, ess, cannot cooccur with 'intentionally'.

(2) a. John-i wuyenhi changmun-ul k'aythuli-ess-ta. nom accidentally window-acc break-past-indicative
   'John accidentally broke the window.'

   topic soon foot-acc bite-HI-speaker's bet-indicative
   'I bet that John's foot would be bitten soon.'

(T. Yoon, personal communication)

However, case facts require that John in (2) should be also interpreted as a potential determinant in some sense. I think that DeLancey's (1985; 6) account, which was originally intended for a "potential agent", provides us with a way to include these cases as our potential determinant. He proposes that, even in these cases, the speaker imputes primary responsibility for the event to John. (2a) would be quite strange as a report of an event in which John has been pushed or thrown against the window by another external force. Thus, an entity, whether intentional or not, counts as a determinant ("agent" in DeLancey), when it and nothing else can be identified as the cause of the event. This way of interpretation, however, leaves us with no possible test, as it mainly relies on the speaker's discretion.

4. It is not the case that a predicate which selects for a determinant subject should pass all the tests. Depending on other factors, some predicates may pass only subsets of them. For example, tallm- 'resemble' passes only tests from the 3rd to the 6th, and po- 'see' fails the 4th test. The former seems to be due to tense/aspect, and the latter due to a morphological blocking from having another lexical item (i.e., po- 'look at').

5. Hong (in progress) argues that a "potential determinant which is syntactically expressed" is always mapped onto a grammatical subject in Korean. Here, I avoid formulating the rule in terms of a subject, to simplify my argument. Also I try to minimize appeal to grammatical functions in this paper, if not crucial for my argument.

6. K. Lee (1987), from which the present paper gets much insight, claims that the HI passive denotes a "spontaneous" situation and its subject is considered to be "responsible" for the situation, whereas non-spontaneity and a "hidden agent" characterize the CI passive. This generalization works, insofar as we deal with HI passive sentences which are interpreted like a middle construction, and thereby cannot be expressed in terms of a CI passive as in (3).

(3) wun-i yel-li-ess-ta.
   fortune-nom open-HI-past-indicative
   'We are in fortune's way.'

However, the three notions, i.e., spontaneity, responsibility, and lack of another agent, do not always point to the same thing. (4) demonstrates that responsibility
should be distinguished from the other two notions. The situation is not spontaneous, as the event was produced by an external agent (i.e., 'policeman'). But the subject, John, is still responsible for the situation, since we can say "John was intentionally caught by the policeman".

    nom policeman-by catch-passive-past-indicative
    'John was caught by the policeman.'

My notion of a determinant is intended to pick out the one who is "responsible" for the situation.

7. As Van Valin has pointed out (personal communication), we can have a passive form "Vstem+HI+CI".

    nom policeman-by arm-nom catch-HI CI-past-indicative
    'John's arm was caught by the policeman.'

The meaning of this passive is the same as simple CI passive: the suppressed agent, but not the subject, is interpreted as a potential determinant, as the meaning of the head (i.e., CI) matters.

8. This preference condition depends on the meanings of predicates.

    baby-nom mother-by sit-causative CI-past-indicative
    'The baby was made to sit by his/her mother.'

    patient-nom nurse-by bed-in lie-causativeCI-past-indicative
    'The patient was made to lie in bed by a nurse.'

Although there are idiolectal differences, (6), where the causee of the lexical causative construction becomes the subject of the CI passive, sounds much better than (17c). This is exactly what we predict. The condition seems to be based on the semantic conflict between animate beings which are more likely interpreted as a determinant and the CI passive which does not allow a determinant subject. This semantic conflict does not arise in (6), as the causee is interpreted as having no controllability in the lexical causative construction (H.S. Lee 1985).

9. For arguments against the case agreement view which are mainly based on dative case, see Maling and S. Kim (1990). I agree that we need a broader principle which subsumes this apparent case agreement fact, which is beyond the scope of this paper.

10. This (i.e., an adjunct phrase being mapped onto the subject) actually suggests that the HI passive is not a passive in a strict sense (Klaiman 1988, Hong in progress).

11. We can find some cases where a suppressed agent is marked 'by' in the HI passive. This 'by' is different from that in the CI passive: the former does not mark a determinant, whereas the latter does. I think that its meaning is more like 'because of'.
nom policeman-by hand-acc catch-HI-past-indicative
'John's hand was caught by the policeman.'

References

The Role of the Korean Topic Marker in Foregrounding Speaker Stance*

Kyu-hyun Kim
University of California, Los Angeles

1. Introduction
This paper attempts to explicate the interactional use of the Korean topic marker *nun* by drawing upon the methodology of conversation analysis (Sacks, Schegloff, & Jefferson, 1974), and by taking a perspective in which various linguistic means are viewed as indexing particular kinds of affect observable in speaker stance (Ochs & Schieffelin, 1989; Besnier, 1990; Biber & Finegan, 1989). The major goal of the present paper is to show that previous semantic and functional characterizations of the Korean and Japanese topic marker1, which are mostly based on the examination of isolated sentences, or written or spoken monologic narratives (Kuno, 1973; Hwang, 1987; Lee, 1987), can be improved and complemented by the characterization of the interactional use of *nun* in terms of how it is actually used by speakers and how it is exploited for affective purposes. Special reference is made to disagreement contexts where *nun* is frequently used. Comparison is also made to the subject marker *ka* whenever relevant.

2. Stance-foregrounding function of *nun*
While mainstream linguistics has concerned itself with referential meaning in language (cf. Besnier, 1990), there has recently been growing interest in the expressive function of language in terms of its constitutive role in indexing various kinds of speaker stance (Besnier, 1990; Ochs & Schieffelin, 1989; Ochs, 1990; Biber & Finegan, 1989)2. With the assumption that syntactic features serve the stance-marking purposes (cf. Ochs, 1990), we can posit that the Korean topic marker *nun* and the subject marker *ka* play a role in indexing particular kinds of speaker stance which bear upon the different predicational modes associated with these particles.

In this light, I posit the basic interactional meaning of *nun* as stance-foregrounding, which refers to the speaker's highlighted attitude whereby it is signaled that the speaker is in full co-alignment with the *nun*-marked entity in the current participation framework (cf. Goffman, 1979). The speaker's stance foregrounded by *nun* signaling his/her co-alignment with the *nun*-marked entity conveys various interactional messages in actual interactional contexts. Most of all, foregrounded speaker stance marks the current utterance as one in which the speaker's personal, subjective response is overtly expressed (cf. Ochs, 1988). It also projects that the speaker will provide contextually new information whose ideational details provide the interactional relevance for the speaker's particular alignment with the *nun*-marked entity in specific interactional contexts (cf. "domain-setting" (Chafe, 1974), "aboutness" (Kuno, 1973), "unchallengeable shared domain" (Lee, 1987))3.

These interactional characteristics of *nun* are in sharp contrast with *ka*, which has traditionally been noted as being associated with an objective description of specific events and factual information (cf. Kuno, 1973; Kim, 1990). The particular speaker stance indexed by *ka* is viewed as that of backgrounded speaker stance. The speaker's affective disposition expressed by such a stance is depersonalization and affective distance, wherein the speaker presents a *ka*-marked...
entity as a part of objective information by downgrading the subjective dimensions of the proposition (Besnier, 1990; Ochs, 1988). This type of stance relates to the manner of predication in which the utterance is presented holistically as a chunk of information, where an event is described objectively (cf. "neutral description" and "exhaustive listing", Kuno, 1973; Kim, 1990).4

In this respect, I will attempt to argue for the interactional meaning of nun that indexes the speaker's foregrounded stance by showing that speakers exploit the meaning in interactional contexts which are compatible with the meaning. First, I will show that the speaker's signaling of his/her foregrounded stance is observed in disagreement contexts in terms of the the speaker's "counteractive" orientation or responsiveness to a perceived challenge or other interactional moves by the interlocutor. It will be argued in this light that the foregrounding of speaker stance is triggered mainly as a counteractive measure to cut off the interlocutor's move. On the other hand, the backgrounded speaker stance indexed by ka, which signals the speaker's detachment from the ka-marked entity, will be shown to be in contrast with the interactional meaning of nun in terms of its use in a context where the speaker does not need to initiate such a counteractive move. Secondly, I will show that the different kinds of speaker stance indexed by nun and ka can be observed with reference to their interaction with a socio-cultural and interactional norm underlying Korean conversational discourse which dictates that direct confrontational disagreement should be avoided. In relation to the interactional meanings of these particles, we can make a point that, for severe disagreement, nun is more appropriate than ka because it indexes the speaker's foregrounded stance, hence subjective viewpoint. For instance, if one disagrees with something that an interlocutor said, he/she can mark serious disagreement by saying "It-nun not true", with "it" referring to the interlocutor's disputed point. However, given the socio-cultural background, such a mode of disagreement should be avoided. If he/she marks "it" by ka in the utterance in the form of "It-ka not true", the disagreement is not serious because ka indexes the speaker's backgrounded stance, and hence is objective. In this respect, I will show that when nun is used in disagreement, what it signals is the speaker's foregrounded stance which is conveyed in the nun-marked phrase serving as a stance-marker, and the message of disagreement is thus communicated by inference through the speaker's oblique countering move against the interlocutor's utterance.

3. nun in conversation

The examination of conversational data suggests in general that nun is used in contexts where the speaker initiates a counteracting move in response to a perceived interactional move by the interlocutor in the preceding context; the speaker uses nun to signal that the nun-marked entity is being brought up to expressly use the perceived interactional move by the interlocutor as a basis for projecting some contextually new information relevant to the nun-marked entity. This observation indicates that, while the nun-marked entity has been traditionally viewed as containing "given" information, it plays a significant role whose interactional import is not merely to mark some given element passively, but to deal with the interlocutor's utterance. Such an interactional function of nun can be saliently observed in disagreement contexts, where the speaker deals with the interlocutor's point either by backing down, or (re)asserting his/her point in disagreement.
3.1. "Backing off" contexts

One context where the stance-foregrounding role of nun can be observed in terms of its orientation to the interlocutor's move is where the speaker backs off in the face of the interlocutor's argument. Example (1) below illustrates such a case. In the context that precedes this stretch of talk, speaker C has said that he cannot understand how one can eat only tortillas and salsa, after saying that one of his friends who had invited him for a meal offered him tortillas and salsa without any other food or toppings:

(1) (Afternoon talk)
1 S: kuroke manhi mok-to -la. mikuk -ai -tul [po like:that a lot eat -RETROS-DEC. American-people-PL look
2 -nikka
-INTERR
I found that American people often eat like that.

--> 3 C: [a kukos mos mok-kess- -ku-kos -un mwo (.) mos-mok-nun
ah that no:able eat-MOD that-NOML-TOP what cannot-eat -ATTR

--> 4 -kos -un ani -ciman
NOML-TOP NEG-CONSS
Ah, I cannot eat that- -That is-, It is not that I cannot eat that,
but, {backing off move}

--> 5 ku -kos -i (.) com kong -kat-un kos -i
that-NOML-SUB a little beans-like-ATTR NOML-SUB
6 iss -o -ya toe -ci -an -a
exist-CONN-NECESS become-NOML-NEG-IE
That is-, (don't you think that) one should have at least some beans.
{Objective supporting move}

In response to C's point that he was surprised at the fact that one can eat only tortillas and salsa, S, at lines 1 and 2, shows disagreement by saying that it is customary to eat like that, at least in America, which serves as a challenge to C's point. In lines 3 and 4, C does not complete his initial utterance at line 3, where he says that he cannot eat things like that, and then shifts to a nun-utterance, where two instances of nun are found. I will first focus on the second instance of nun in the utterance "It is not that I cannot eat that", which marks the speaker's backing off move. In this utterance, what C rejects is not something that is directly picked up from the preceding interlocutor's utterance, but something which C presents as his own opinion, which actually is picked up from his abandoned utterance at line 3. Such a context clearly constitutes one in which the speaker can foreground his stance and provide a subjective viewpoint, because the speaker does so not for the purpose of directly countering the interlocutor's argument.

Another important point is that, in lines 3 and 5, "kukos (that)" is marked by nun and ka respectively in different sequential contexts. The nun-marked "kukos" at line 3 is used in a position where the speaker counters a challenge in the immediately preceding turn, whereas the ka-marked "kukos" at line 5 is used in a place where there is no such need, because the speaker, after backing down in the
face of a challenge from the interlocutor and showing a partially accommodating attitude in the preceding context, is now in a position to focus on producing his own account. Therefore, we find that the use of nun is specifically oriented to the interlocutor's counteracting move which provides an interactional basis on which the speaker can foreground his stance. The stance-backgrounding function of ka is shown by way of its deployment in a context where the speaker can build his own case, with the interlocutor's argument having been dealt with in the preceding context.

3.2. (Re)assertion of disagreement

Example (2) illustrates instances of nun which are used in a context where speakers disagree with each other. Preceding this segment of conversation, S asked H whether he knew of any research papers which present a nice treatment of the Korean modal marker "kess", saying that those she had looked at were not very helpful. At line 1, H suggests one particular paper:

(2) (Class topics)
1 H: Kim kyoosunim paper-e com nawa -iss -nunte
   Kim professor paper-LOC a little come:out-exist-CIRCUM
   Prof. Kim's paper discusses something about it.

--> 2 S: casehi -nun...
   In detail-TOP...
   (The paper does not show) in detail...{Oblique countering move}
   :
   ((several overlaps in lines 3 through 5))

--> 6 H: haetun hyonsang -e taehaeso-nun //nawa iss -unikka
   anyway phenomenon-LOC about -TOP come exist-REASON
   Anyway, it talks about the phenomenon itself. {Oblique countering move}

7 S: ne. ne. ne.
    yes yes yes {pro forma agreement}

--> 8 S: kunte uski -nun -kos -un park jinsoo ssi -ka paper-lul
    well funny-ATTR-NOML-TOP Mr. Park Jin-soo-NOM paper-OBJ

9 kess-e taehaeso kongbuha-si -oss -na -po-a -yo.
    'kess'-LOC about study -HR-PST-NCOMM-see-IE-DEF

10 kess paper-lul manhi cu -si -oss -nunte ku kyoosunim
    'kess' paper-OBJ a lot give-HR-PST-CIRCUM that professor
By the way, what is funny is, Mr. Park Jin-soo seems to have studied "kess". He gave me a lot of papers about "kess", and each of the professors who wrote those papers is funny... {Oblique countering move} 
(S goes on to talk about how the authors of the Korean papers criticize each other by offering counter-examples to every proposal anyone makes.)

While I will argue that this stretch of talk as a whole constitutes a disagreement sequence, I will first focus on the portion of the data from lines 1 to 7, where S and H overtly disagree with each other. After H suggests one paper in response to S's query, S, at line 2, disagrees with H's suggestion by using a nun-utterance. What is noteworthy in this nun-utterance is that disagreement is contextually inferred even though the utterance is not completed. That is, the nun-marked adverbial at line 2 "casehi-nun (In detail-nun)" by itself signals that S is disagreeing with H in relation to the value of the particular paper he suggested. This case provides a striking example in which nun indexes the speaker's foregrounded stance through the nun-marked adverbial, which is brought up by the speaker as a stance-marker, and disagreement is communicated by inference.

A similar pattern is observed in H's nun-utterance at line 6. This utterance is produced after several overlaps where the speakers start talking simultaneously, which indicates the sensitive quality of the interaction caused by S's disagreement at line 2. In this utterance, H defends his choice of the particular paper in countering S's disagreement by asserting that it at least talks about the grammatical phenomenon of "kess". That the nun-marked phrase alone conveys disagreement is strikingly observed by the place where S's pro forma agreement is produced in the next turn at line 7; it is produced just after the nun-marked phrase in H's utterance, as the double slash (/) at line 6 indicates. That is, S's interruption of H's utterance just after the nun-marked phrases shows that S inferred from the nun-marked phrase "about the phenomenon" that H is disagreeing with her even before the predication is provided. As in the case of S's disagreement at line 2, what nun does here is to directly index the speaker's stance through the phrase, and disagreement is communicated by inference through the speaker's oblique countering move.

That S's agreement at line 7 is a pro forma agreement is partly supported by her extended turn beginning at line 8, initiated by a nun-marked thematic nominalization ("What is funny is...") (cf. Halliday, 1985). At one level of analysis, the use of the thematic nominalization marks a topic shift in the sense that S is initiating an extended turn about her general evaluation of the Korean papers in question. Moreover, in that the thematic nominalization initiates a segment of talk in which she produces a negative evaluation of the papers in general, it can be viewed as marking a continuation of S's disagreement with an implicit orientation to H's persistent opposition in the preceding context. Assuming that a thematic nominalization can be treated as a canonical stance-marker which strongly expresses the speaker's attitude towards the following utterance, the role of nun that foregrounds speaker stance can be saliently observed here in the sense that the speaker reasserts her disagreement from another perspective and in a different direction, i.e., by initially expressing her stance conveyed in the thematic
nominalization and then talking about a more general topic which still reflects her negative attitude toward the papers. The use of nun, in this sense, can be viewed as foregrounding speaker stance in terms of the speaker's orientation to the interlocutor's opposition, thus obliquely countering the interlocutor's persistent disagreement. Therefore, we find that the use of nun for thematic nominalization, as was the case in the preceding instances of nun, displays the speaker's predisposition to signal her foregrounded stance, and to convey disagreement by inference, thus avoiding a frontal, hence serious, encounter.

While a nun-marked thematic nominalization is frequently found in a context where the speaker initiates an oblique countering move in response to the interlocutor's challenge, ka-marked thematic nominalizations occur in different kinds of contexts. Example (3) illustrates one such context. In the context that precedes this utterance, the interlocutors have been advocating parking permits which can be purchased a little cheaper when one buys them a couple of weeks into the quarter:

(3) (Lunch with H)

--> 1 K: ceil okulha -n -kos -i yolhul -ccum cina-so
        most distressing-ATTR-NOML-SUB 10 days-around pass-CONN

2   ka-ss   -ul   -tae
        go-PST-ATTR-time

What is most distressing is when you go (to the parking office) about 10 days after a quarter began. [Objective supporting move]

Given that in the preceding context the interlocutors agreed on the unfairness of having to pay the full amount when buying a parking permit even after several days elapsed after the quarter began, the ka-marked thematic nominalization can be treated as K's collaborative assessment about the preceding talk, where he presents a hypothetical situation in which such unfairness is felt most acutely. In this sense, we find that the ka-utterance is used in a context where the speaker is not initiating any counteractive move to the preceding context of talk. As was the case in the ka-utterance in example (1), the stance-backgrounding role of ka can be observed in terms of the way in which the utterance is produced as an objective supporting move for the preceding talk.

The use of nun for directly indexing the speaker's foregrounded stance and indirectly indexing disagreement by inference is also observed in a formulaic expression "munce-nun", which can be translated into English "The point is...". This expression is frequently produced in the context of argument. Example (4) illustrates an instance of this expression, which I overheard during an informal argument between students majoring in linguistics:

(4) (Linguistics discussion)

((In an extended argument, speaker A has disagreed with B by arguing that language is innate, and the language input that children receive is limited.))

--> 1 B: kunte munce-nun ai -tul-i silce -lo input-ul manhi
        well  point-TOP child-PL-SUB reality-INS input-OBJ a lot
We can readily note that B is producing the *nun*-utterance with a view to obliquely countering A's point. This would be a case in which the speaker presents a lexical item with a general meaning as a stance-marker in which his stance is foregrounded, and disagreement is contextually inferred.

In sum, the preceding examples provide evidence on the basis of which we can observe that the stance-foregrounding function of *nun* is at work in a way that does not mark confrontational disagreement, as in backing off or oblique disagreement sequences. It is noteworthy, in this regard, that, while a *nun*-utterance is rarely used for marking disagreement by specifically rejecting the interlocutor's point, it is often used in a context where disagreement with the interlocutor is actually meant to encourage him/her. It is also noteworthy that full agreement with the interlocutor's point is usually done through a positive adjectival assessment with zero-marking. This would be so because in marking full agreement with the interlocutor, there is no reason for foregrounding one's stance. If *nun* is used in agreement, as in "kukos-un maca (That-*nun* is right)", it would not mark full agreement, but still connote the speaker's negative attitude which is implied to hold in some other respects than in the matter denoted by the *nun*-marked phrase.

As I mentioned above, when *ka* is used in disagreement contexts, the nature of disagreement marked by *ka* is not serious. This point is illustrated by example (5). In the context that precedes this conversation, the interlocutors have talked about a computer purchased by J, and in lines 1 and 2, K says that it is the best of its kind, which was already noted by J in the preceding context. The topic was originally triggered by H, who had been in the computer store and had done a price survey:

(5) (TA meeting)

1 K: ku-cung -eso ceil coh -un -kos -i -l -kos
that-among-LOC most good-ATTR-NOML-COP-ATTR-NOML

2 -i -eyo
COP-DEF
I think it is the best of its class.

3 H: ani olma -laku -yo?
no how:much-QUOT-DEF
No, how much (did you say you paid for the computer)?

4 J: con sabaek sasip yuk pul
thousand four:hundred forty six dollar
One thousand four hundred forty six dollars.

--> 5 H: kuromyom ceil coh -un -kos -i ani -eyo
then most good-ATTR-NOML-SUB NEG-DEF
Then, that's not the best one. {Objective countering move}
After asking J about the price, H marks disagreement in line 5 by using a ka-utterance. We can readily note here that H is not dealing with any counteractive move from the interlocutors, who simply assessed the class of J’s computer in the preceding talk. Instead, as the authority in the area of computer price tags, H initiates talk by asking factual information about the price of J’s computer, and presents the ka-utterance to dispute the interlocutor’s assessment, particularly K’s utterance at lines 1 and 2. Even though disagreement is marked rather directly, it is not serious because it is done in an objective manner, presumably on the basis of information that H gathered from her price survey. Such an objective stance can be treated as being indexed by the stance-backgrounding role of ka.

4. Conclusions

The preceding discussion suggests that the pragmatic nature of a nun-marked entity should be characterized not merely as "given" or "old" information but as a stance-marker whose discoursal and interactional relevance is established by the speaker’s orientation to the context of talk. We can roughly characterize the signaling of foregrounded speaker stance as marking "interactional focus". In the same vein, the predicate following nun, which has previously been viewed as a locus for focus (Hwang, 1987), can be characterized as providing "ideational focus" which assures in retrospect the relevance of the foregrounded stance indexed by the nun-marked entity.

These two different kinds of focus seem to interact with each other in a subtle way in various communicative contexts. For instance, in some disagreement contexts where the mere utterance of a nun-marked phrase signals the disagreement, the interactional focus plays a significant role, because it reflects the speaker's attempt to single out a particular phrase as a stance-marker in the context of particular sequences and the socio-cultural norm that impinges on them. We can make a point in this respect that the contrast-marking function of nun (cf. Kuno, 1973) can be treated as deriving from the foregrounded speaker stance interacting with the contextual need to be oriented to the preceding talk. Such a need would inherently require the speaker's effort to negotiate a place to foreground his/her stance by situating a nun-marked entity in a context where it lends itself to the contrastiveness with some inferrable link with the previous context.

The cases of nun-marked thematic nominalizations and the formulaic chunk examined above also point to an important role of the interactional focus, though in a different sense; the speaker foregrounds his/her stance by bringing up an internal state predicate or a lexical item with a general meaning. In these cases, however, obliquely made disagreement is also contributed significantly by the ideational focus reflected by the specific ideational details in the predicate. Moreover, given that these instances of nun display a rather salient degree of thematic function (cf. Kuno, 1973) compared with the other instances of nun examined, we can make a preliminary point that the degree of ideational focus, while contributing to establishing a contrastive context, also correlates with the degree of thematic message. While this question will be an important one that should be pursued in future research, this point suggests that in other conversational contexts such as question-answer or story-telling sequences, thematic nun would be more predominantly used than in disagreement contexts, because in these contexts the speaker would be less pressured to negotiate the relevance of a nun-marked entity, and thus more oriented to giving a high degree of ideational focus to the predicate by providing new information. In the same vein, we can see that thematic nun
would be predominant in elicited spoken or written narratives because the narrator, without any great need to be attentive to an interactional move by the hearer, can funnel his/her interactional effort to providing ideational focus with a discourse-organizational concern in terms of how to organize episodes centering around a prominent character.

Finally, it should be noted that the stance-foregrounding role of nun, while contextually triggered and given relevance by the need to be responsive to the interlocutor in natural conversation, also evokes a context in which the interlocutor's response is called for. This means that, in the current participation framework in which the speaker can variably relate to the utterance and the interlocutor (cf. Goffman, 1979), the speaker's co-alignment with a nun-marked entity would inherently be evoked by and also evoke the speaker's co-alignment with the interlocutor. Therefore, even in monologues where there is no need to respond to the interlocutor's utterance, it seems to be the case that nun still invites the hearer's attention by evoking its interactional function of responding to the interlocutor, and signals the narrator's co-alignment with the hearer by inviting the hearer's co-participation in the construction of the narrative. As for ka, which indexes the speaker's background stance and detachment from the ka-marked entity, it would not trigger such an alignment of the speaker with the interlocutor. Rather, we can observe that in many contexts the use of ka marks the speaker's alienation from the interlocutor, thus causing a different way in which the speaker relates to the interlocutor and the utterance.

As a whole, while in this paper I have tried to show the interactional import of foregrounding speaker stance in conversational contexts where nun signals (i.e., directly indexes) foregrounded speaker stance, and disagreement is contextually inferred (i.e., indirectly indexed), there should be further attempts to explore the interactional uses of nun in other interactional contexts. Even though it would be possible to start from a neat analysis of nun used in an monologic narrative, or even in an isolated sentence, and extend the findings to an analysis of seemingly chaotic interactional use of nun in spontaneous conversation, I believe that the converse route should be taken, with the assumption that talk in interaction constitutes the most basic, primordial context of language use. The present study, in this sense, is presented as initiating a small pilot effort to break ground in an attempt to provide a handle for additional future research that takes an interactional perspective in addressing nun or other linguistic phenomena in Korean.

Footnotes
* I thank Professors Robert Kirsner, Marianne Celce-Murcia, Emanuel Schegloff, and Elinor Ochs for their insightful comments on the earlier version of this paper. However, I am wholly responsible for any problems or errors that remain.

1Since the Korean topic marker nun and the Japanese topic marker wa display striking similarities, I will also refer to findings on wa whenever they are relevant to nun. However, the assumed relevance of the findings on wa to nun would be speculative at best.

2According to Biber & Finegan (1989), the notion of speaker stance is defined as referring to speaker's attitudes, feelings, judgments, or commitment concerning the propositional content of a message.

3The sentence-level association of the thematic nun with generic sentences referring to a permanent state of a referent, rather than sentences referring to a specific,
temporary event (cf. Kuno, 1973), can be viewed in terms of the compatibility of
the nature of the predicate with the meaning of nun, because foregrounded speaker
stance would be more significantly involved in identifying an "unobservable"
permanent state such as generic, characteristic traits than in referring to an

4The stance-foregrounding and stance-backgrounding functions of these particles
are posited as the interactional meanings which reflect the speaker's interactional
strategy of exploitation made possible by their invariant meanings, which I earlier
posited as "speaker-relevant focus" for nun and "event-relevant focus" for ka in the
framework of the form-content analysis (Kim, 1990). The speaker-relevant focus
is defined as a semantic instruction signaling that the speaker imbues a nun-marked
referent with a high degree of subjectivity in relation to the following predicate.
The event-relevant focus, on the other hand, is a semantic instruction signaling that
the speaker is presenting a ka-marked referent, highlighted only in relation to the
event being described, not in relation to the speaker's subjectivity. (For detailed
introduction to the form-content analysis of the Columbia school, see Kirsner
(1979).)

5In the English translation of the following examples, I will use the bold type for
nun-marked entities, and, whenever relevant, I will underline ka-marked entities.
Some English glosses are followed by a bracket in which the kind of interactional
move carried out by the utterance is specified. In the Korean transcripts, overlaps
are marked by "[", and interruption is marked by "]". An uncompleted utterance is
followed by two hyphens"- -". (For transcription conventions, see Sacks,
Schegloff, & Jefferson (1974).)

6nun and ka are realized as un and i respectively when preceded by a consonant.

7In the use of thematic nominalization which initiates an extended turn, we also find
a sense in which the speaker establishes a story-telling context for the purpose of
fending off the interlocutor's persistent opposing position.

8One such instance of nun was found in the data in the following context. After
interlocutor A expresses frustration by saying that his classmates are going to
conferences while he is not able to do so, interlocutor B downgrades A's point by
producing a nun-utterance "kukos-un yakwa-ya (That's nothing)", and then talks
about a more serious situation of his in which his classmates are publishing their
papers in prestigious journals. This would be a case in which a direct rejection of
the interlocutor's point is done to support the interlocutor.

9However, one can mark a strong agreement by adding adverbials like "congmal
(really)" in this utterance. In this case, a strong agreement would be inferred by the
rich ideational detail provided in the predicate (see conclusions for the interactional
focus vs. the ideational focus in nun-utterances).

10This point is further supported by the fact that K's assessment at lines 1 and 2
contains the epistemic stance marker "-ikos", which indexes the speaker's objective
and distancing stance (see footnote 15).

11The interaction between the two kinds of focus in a nun-utterance is inherently
intertwined with the discourse context. We can note in this regard that a sentence-
level interpretation of a nun-utterance is likely to change according to what kind of
discourse context we evoke in interpreting the sentence. For instance, the use of
nun in a description of a specific event like "John-nun came" primarily yields a
contrastive reading at the sentential level (cf. Iwaski, 1987; Kim, 1990), which I
believe is attributed to the evocation of a conversational context where the interactional focus is more salient. However, a thematic reading becomes more relevant if we imagine that the sentence is being produced in an extended narrative about the nun-marked referent, where the ideational focus would be more salient.

However, even in monologues, some degree of contrastiveness would still be inferred in a way that the narrator shows responsiveness to the preceding context.

It seems to be the case that the thematic function of nun is salient in the "entity-oriented" type narrative rather than the "event-oriented" type narrative (cf. Kim, 1990). The former refers to narratives where the narrator talks about some major referent(s) with which he/she is familiar, and the latter refers to narratives like the Pear story where the narrator reports a series of events involving a number of anonymous participants. As Kim (1990) reports, thematic nun occurs much more frequently in the Grandpa story, an entity-oriented narrative where the narrator talks about his grandfather, than in the Pear story, where there is no major character that the narrator is familiar with and can co-align himself with.

This characteristic of nun is congruent with Lee's (1987) observation that nun establishes unchallengeable common grounds whose relevance is taken for granted for the subsequent discourse.

The distinction between the two kinds of speaker stance indexed by nun and ka and their different degrees of sensitivity to interaction may generally apply to other areas of grammar, where linguistic signs that denote more or less the same meaning are differentiated by their role of indexing subjective or objective speaker stance. For instance, Suh (in progress) shows that, between the Korean epistemic stance markers "-kess" and "-(u)kos", the former indexes a subjective, speaker involving stance and the latter an objective, distancing one. As she notes, "-kess" is more tuned to the interlocutor's utterance than "-(u)kos" in natural conversation, which points to a strong correlation between speaker stance and the degree of interactional sensitivity.

References


Unifying syntactic and semantic approaches to unaccusativity: A connectionist approach

Géraldine Legendre    Yoshiro Miyata    Paul Smolensky
University of Colorado, Boulder*

It appears to be a universal property of intransitive verbs that only certain subsets are acceptable in particular syntactic contexts. Are the crucial properties of intransitives that govern their acceptability in these diagnostic contexts for unaccusativity semantic, syntactic, or both? Purely semantic, heavily syntactic, and a few mixed positions have been advocated in the literature. In this paper we examine a language, French, that exhibits a rich set of such diagnostic contexts (Section I); we describe in some detail a heavily syntactic approach and identify important weaknesses (Section II); we examine some purely semantic proposals and show their inadequacy (Section III); and finally we present a new approach that unifies the syntactic and semantic ideas within a novel, connectionist-based framework called Harmonic Grammar (Section IV).

I. The basic phenomenon

Unaccusativity phenomena in French provide a particularly challenging pattern of data. Legendre has identified ten diagnostic contexts, the most broadly applicable of which are the five illustrated in (1–5).¹

Object Raising (OR)

(1)  a. La neige est facile à faire fondre.
The snow is easy to make melt.
   b. *Les jeunes sont faciles à faire méditer.
   Young people are easy to make meditate.

Croire "believe" constructions (CR)

(2)  a. Je croyais Marie déjà sortie.
    I believed Marie to have already gone out.
   b. *Je croyais Marie éternuée.
    I believed Marie to have sneezed.

Participial Equi constructions (PE): (the missing argument in the adverbal clause corresponds to the boldface main clause argument).

(3)  a. Parti avant l’aube, Pierre est arrivé à destination le jour même.
    Gone before dawn, Pierre arrived at his destination on the same day.
   b. *Travaillé toute la nuit, Pierre s’est endormi à 8h du matin.
    Worked all night, Pierre fell asleep at 8 a.m.
Participial Absolute constructions (PA): (no coreferential link between the two clauses)

(4) a. Les Duponts partis, toute la famille se mit à table.
The Duponts gone, the whole family sat down for dinner.
b. *Le candidat parlé, l’audience se tut.
The candidate spoken, the audience turned quiet.

Reduced Relatives ("adjectival formation") (RR)

(5) a. La neige fondu a formé de la boue.
The melted snow formed mud.
b. *Son état empiré est alarmant.
His worsened condition is alarming.

II. The syntactic approach

The syntactic approach is founded on the following generalization: in many diagnostic contexts, there is a parallel between, on the one hand, the (a,b) contrast illustrated in (1–5) of the arguments of the contrasting classes of intransitive verbs, and, on the other, contrasts between the two arguments of a transitive verb, illustrated in (1–5c,d).

(1) c. La vérité est facile à faire dire aux enfants.
The truth is easy to make children tell.
d. *Les enfants sont faciles à faire dire la vérité.
The children are easy to make tell the truth.

(2) c. Je croyais Marie arrêtée (par la police).
I believed Marie to be arrested (by the police).
d. *Je croyais la police arrêté Marie.
I believed the police to have arrested Marie.

(3) c. Arrêtée par la police, Marie a dénoncé ses amis.
Arrested by the police, Marie denounced her friends.
d. *Arrêtée Marie, la police l’a interrogrée.
Arrested Mary, the police interrogated her.

(4) c. La nouvelle constitution approuvée (par le congrès), le président renforça ses pouvoirs.
The new constitution approved (by congress), the president consolidated his power.
d. *Le congrès approuvé la nouvelle constitution, le président renforça ses pouvoirs.
Congress [having] approved the new constitution, the president consolidated his power.

(5) c. La personne arrêtée par la police n’a jamais été relâchée.
The person [who was] arrested by the police was never freed.
d. *Le policier arrêté Ceaucescu a été fêté.
The policeman [who] arrested Ceaucescu was celebrated.
Arguing that the contrasting behavior in diagnostic contexts of the two arguments of a transitive verb is due to their different structural roles or grammatical relations, proponents of the syntactic approach to unaccusativity have postulated that the contrasts among intransitives in diagnostic contexts arise from the same cause: different underlying grammatical relations of their arguments.


There are two classes of intransitives that differ *structurally*: the arguments of the two classes parallel the subject and direct object of transitives. Specifically, the arguments of one class of verb (RG: "unergatives"; GB: "intransitives") are deep subjects (RG: "initial 1s"; GB: "external argument"), while the arguments of the other class (RG: "unaccusative"; GB: "ergative") are deep direct objects (RG: "initial 2s"; GB: "internal argument").

On the syntactic account, the reason a diagnostic context accepts unaccusative verbs while rejecting unergatives is that it involves a construction with well-formedness conditions that require the argument of the intransitive to be an underlying direct object (or heading a 2-arc, in RG terminology). For the five French diagnostic contexts considered here, such well-formedness conditions are presented in (7–10) (Legendre, 1989a; (7) was proposed in Legendre, 1986).

(7) **Condition on Object Raising (OR):**

An Object Raising structure is well-formed only if the raisee heads only 2-arcs in any clause below the raising predicate.

(8) **Condition on *croire* unions (CR):**

Only a nominal heading a 2-arc at some level in the embedded clause can appear in *croire* unions.

(9) **Condition on Participial Clauses (PE and PA):**

A participial clause is well-formed only if the argument (ultimately deleted in PE, realized in PA) of the participial verb is a "deep" object and a "surface" subject.

(10) **Condition on Reduced Relatives (RR):**

A Reduced Relative is well-formed only if the "surface" subject is a "deep" object.

Note that a verb that is acceptable in one of these diagnostic contexts must be unaccusative, but that not all unaccusatives will necessarily pass each such test. In fact, intransitives vary greatly in how many of the five tests (1-5) they pass.

<table>
<thead>
<tr>
<th>Verb</th>
<th>Meaning</th>
<th>Tests Passed</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>augmenter</em></td>
<td>&quot;increase&quot;</td>
<td>5</td>
</tr>
<tr>
<td><em>arriver</em></td>
<td>&quot;arrive&quot;</td>
<td>4</td>
</tr>
<tr>
<td><em>geler</em></td>
<td>&quot;freeze&quot;</td>
<td>4</td>
</tr>
<tr>
<td><em>pleurer</em></td>
<td>&quot;cry&quot;</td>
<td>1</td>
</tr>
<tr>
<td><em>rougir</em></td>
<td>&quot;blush&quot;</td>
<td>1</td>
</tr>
<tr>
<td><em>aller</em></td>
<td>&quot;go&quot;</td>
<td>0</td>
</tr>
<tr>
<td><em>Exister</em></td>
<td>&quot;exist&quot;</td>
<td>0</td>
</tr>
</tbody>
</table>
(It is interesting to note that the Italian counterparts of the last three verbs are all unaccusative, according to Rosen, 1984.) Far from an occasional failure of a putative unaccusative to pass all the tests, the data display a large number of such failures, comprising a complex pattern that wants explanation.

Among the major reasons for unaccusatives failing tests are several aspectual factors. (12) illustrates one such additional necessary well-formedness condition relevant to the French diagnostic contexts (Legendre, 1989a):

(12) **Aspectual restriction on Participle Absolutes:**
Only **perfective** verbs may appear in the PA construction.

In fact it has long been clear that the syntactic unaccusativity hypothesis (6) must be augmented with aspectual conditions in order to account for the full pattern of data presented by diagnostic contexts for unaccusativity. It is for this reason that we have characterized approaches such as Perlmutter (1978, 1989), Rosen (1984), and Burzio (1986) as "heavily" rather than "purely" syntactic.

But in fact there is need to strengthen the semantic component further in order to face the full complexity of the phenomenon: Semantic properties of the **argument** also can affect acceptability in diagnostic contexts. Illustrations of such effects in French are provided in the following table.

<table>
<thead>
<tr>
<th>Verb</th>
<th>Argument</th>
<th>Test acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>arriver</strong>  &quot;arrive&quot;</td>
<td>Pierre, un malheur  &quot;a disaster&quot;</td>
<td>–?OR, +?OR</td>
</tr>
<tr>
<td><strong>céder</strong>  &quot;to give in&quot;</td>
<td>l’enfant, la glace  &quot;the child, the ice&quot;</td>
<td>+OR, –?OR</td>
</tr>
<tr>
<td><strong>disparaître</strong>  &quot;disappear&quot;</td>
<td>l’enfant, la tache  &quot;the child, the stain&quot;</td>
<td>+?OR, +OR</td>
</tr>
<tr>
<td><strong>entrer</strong>  &quot;enter&quot;</td>
<td>l’homme, le train, le vent, les marchandises  &quot;the man, the train, the wind, the goods&quot;</td>
<td>?OR, +CR,+PE,+PA,+RR, –OR, –CR,–PE,–PA, +RR</td>
</tr>
</tbody>
</table>

We conclude that any account of unaccusativity phenomena that strives for a reasonable degree of completeness must provide a major role for semantic/aspectual factors.

It is worth noting before moving on to consider purely semantic approaches that cross-linguistically there appears to be very little positive syntactic evidence for unergativity; while unaccusativity tests are quite abundant cross-linguistically, unergativity tests (diagnostic contexts accepting only unergative verbs) are extremely rare. As a result, the class of unergatives is often defined negatively, as those intrasitives that fail to be picked out as unaccusative by the available tests. This may have the consequence of artificially increasing the appearance of a test-independent dichotomy of intrasitives into two classes. In fact, in French, Legendre (1989b) has uncovered one unergativity test: the pronoun *on* allows two interpretations — the definite interpretation ‘we,’ and an arbitrary interpretation ‘someone’ — but they are constrained by (13), as illustrated in (14).
(13) **Interpretation of on:**
The arbitrary interpretation is restricted to deep subjects (unergative and transitive structures).

(14) a. **On lui a confié une tâche délicate.** (transitive)
    *Someone/we entrusted him with a tricky task.*

b. **On a téléphone à Pierre.** (unergative)
    *Someone/we called Peter on the phone.*

c. **On avait été confié à l’Assistance Publique.** (passive)
    *We*/*someone had been entrusted to Child Welfare.*

d. **On s’est enfin tu.** (unaccusative)
    *We*/*someone finally shut up.*

e. **On est allé au cinéma.** (unergative or unaccusative?)
    *We*/*someone went to the movies.*

This unergativity test sheds some further doubt on the robustness of the unaccusative/unergative dichotomy, for it fails to positively identify as unergative an important verb – *aller* ‘go’ – that would be classified as unergative by virtue of failing all five unaccusativity tests (11).4

**III. The semantic/aspectual approach**

Given the apparently major role of semantic/aspectual factors in diagnostic contexts for unaccusativity, it is natural to consider a purely semantic account, which can be stated in a very general form as:

(15) **Semantic hypothesis (general):**
Semantic/aspectual considerations are sufficient, without positing structural differences among intransitives, to account for acceptability patterns in diagnostic contexts.

This hypothesis denies the uniform structural characterization of two subclasses of intransitives posited in (6), so unaccusativity ceases to be treated as a unified phenomenon: each diagnostic context singles out its own idiosyncratic class of acceptable intransitive verb/argument pairs, based on particular semantic/aspectual features.

The generality of (15) makes it almost impossible to refute, since there is an open-ended set of semantic/aspectual features that might be appealed to. In order to formulate a more specific and readily testable version of the purely semantic hypothesis, we consider some concrete existing proposals from other languages:

<table>
<thead>
<tr>
<th>Unaccusativity test</th>
<th>Relevant semantic/aspectual features</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch Impersonal Passivization</td>
<td>agentive vs. non-agentive</td>
<td>Zaenen (1989)</td>
</tr>
<tr>
<td>Dutch Tense Auxiliary Selection</td>
<td>telic vs. atelic</td>
<td>Zaenen (1989)</td>
</tr>
<tr>
<td>Italian Tense Auxiliary Selection</td>
<td>activity vs. state, achievement, accomplishment</td>
<td>Van Valin (1990)</td>
</tr>
<tr>
<td>Acehnese Subject Cross-referencing</td>
<td>agentive vs. non-agentive</td>
<td>Van Valin (1990)</td>
</tr>
</tbody>
</table>
Taking these semantic/aspectual properties as a plausible starting point, we have:

(16) **Semantic hypothesis (specific):**

Whether an intransitive verb/argument pair is acceptable in a given diagnostic context is predictable from the verb’s classification as Activity/Accomplishment/Achievement/State, or from its aspectual features (e.g. telicity), or from the semantic features of the argument (e.g. volitionality) or from the semantic features of the verb (e.g. verbs of motion).

To test this hypothesis, we examined the predictability from these semantic and aspectual properties of acceptability in the five unaccusativity tests OR, CR, PA, PE, RR (1–5) and the one unergativity test, ON (14). We studied a set of 355 intransitive verb/argument pairs, derived from a nearly exhaustive list of French intransitives. Some highlights of this study are summarized below; the first five are graphically represented in Figure 1, in which the percentages of verbs that pass or fail each test are shown by the lengths of bars which are white or black, respectively. \(^5\) Note that the last column of Figure 1 corresponds to the one unergativity test, ON, and is more-or-less anti-correlated with the other five columns; in qualitatively summarizing these data, we will use "unaccusative" as an abbreviation for "failing the ON test and passing the others" and "unergative" for the reverse.

**Aspectual verb classes.** Following Vendler (1967) and Dowty (1979), Van Valin (1990) characterizes a four-way distinction between Activity, State, Accomplishment, and Achievement verbs based on a set of criteria discussed in Dowty (1979). Dowty warned that these four classes have fuzzy rather than absolute boundaries, but Van Valin takes the criteria from Dowty as definitive. We have used a subset of the criteria mentioned in Dowty (1979) and Van Valin (1990), namely, criteria 1, 3, 4, 7, 8, 9 of Dowty (1979; p.60).\(^6\) For French, this characterization covers 25% of our data; the remaining 267 of 355 verb/argument pairs do not fit the patterns characteristic of any of the four classes. The data set contains 61 Activity, 16 State, 10 Achievement, and 1 Accomplishment verbs. (Accomplishment verbs are typically transitive verbs). Activity verbs do show a clear tendency to be unergative: all 61 fail the CR, PA, PE, and RR tests, and 81% fail while 16% pass the OR test (3% indeterminate), and 78% pass while 18% fail the ON test. The remaining 83% of verb/argument pairs (State, Achievement, Accomplishment, and Undetermined) do not show a clear pattern.

**Superclasses.** Various aggregations of these four classes into "superclasses" have been studied: Van Valin (1990) defines the Actor superclass as the union of the Activity and Accomplishment classes, and Undergoer as the union of States and Achievements; Zaenen (1989) and Van Valin (1990) define the Telic superclass as the union of Accomplishments and Achievements, and the Atelic superclass as the union of Activities and States. Like the four basic classes, these superclasses cover 25% of the data. There are only weak correlations between these superclasses and the tests, except for those that arise as an almost direct consequence of the one strong tendency of Activities to be unergative.
**Telicity.** Rather than treating Telic/Atelic as two superclasses including 11 and 77 verb/argument pairs, respectively, we can treat them as covering all the data by defining Telic or Atelic verb/argument pairs to be those for which it is unacceptable or acceptable, respectively, to assert that the action occurred ‘for an hour.’ Here there is a moderate one-way correlation: Atelic verbs are more likely to be unergative (e.g., OR: 34%+, 61%--; CR: 22%+, 78%--; RR: 21%+, 78%--; ON: 34%-, 64%+), but Telic verbs do not exhibit a clear pattern (e.g., OR: 53%+, 35%--; CR: 55%+, 40%--; RR: 55%+, 43%--; ON: 69%-, 28%+).

**Animacy.** Verbs taking animate arguments are much more likely to be unergative (OR: 22%+; 69%--; other unaccusativity tests: −15%+, −83%--; but ON: 42%−, 56%+) but those taking inanimate arguments are almost equally likely to pass or fail the tests (OR: 58%+, 35%--; CR: 45%+, 55%+; PA, PE, RR: −43%+, −55%--; ON does not apply to inanimates).

**Agentivity.** Agentivity shows the same pattern of correlations as Animacy, with verbs taking volitional arguments displaying a somewhat stronger tendency to be unergative.

It is interesting to note that the only reasonably clear predictions from purely semantic tests that come out of this exploration are those that entail unergativity; within the heavily syntactic approach, on the other hand, it is overwhelmingly conditions entailing unaccusativity that are found.

Our conclusion from this study is that prediction of acceptability in these diagnostic contexts can not be done on the basis of these aspectual and semantic properties, considered separately, with one exception: Activity verbs are reliably unaccept-able in CR, PA, PE, RR. It is certainly possible that one could find combinations of these properties, or new semantic/aspectual properties, that would validate (15). Rather than pursuing this direction, we now present an alternative based on the hypothesis that semantic and aspectual properties do contribute to acceptability judgements, but in a way that is characterized by numerically graded preferences rather than hard rules. These soft rules are part of what we have called a Harmonic Grammar, which we describe below. In addition to these semantic/aspectual preferences, we assume that the grammar also recognizes a structural difference between two kinds of intransitive verbs, which parallels the structural difference between the two arguments of transitive verbs. But, as with the semantic/aspectual factors, we will assume that the rules in which such a structural distinction figure are soft rules.

**IV. Integrating syntax and semantics: A connectionist account**

Our goal here is to integrate (i) the structural parallel between transitives and intransitives central to the syntactic approach with (ii) the quantitative tendencies revealed through the semantic approach, to account for the full complexity of acceptability judgements in the French data: the full pattern of graded judgements of a set of 8393 sentences. These sentences involve 11 constructions in which 408 verbs are embedded: 183 transitives and 225 intransitives.
Our account can be looked at in a variety of ways. The first is as a connectionist network (for fuller discussion of an earlier version of this network, see Legendre, Miyata & Smolensky, 1990a) Each sentence to be judged is presented as an input pattern, and a graded acceptability value is produced as output. When the embedded verb is transitive, the sentence is represented by indicating which of the 11 constructions is used, whether the embedded verb’s subject or direct object is the target of the construction, a featural description of the embedded verb, and featural descriptions of its two arguments. The features used for the arguments are Volitionality, Animacy, and Definiteness; the embedded verb is represented by six features that were learned by the connectionist network through back-propagation. The same representation is used for sentences involving embedded intransitives, except now the network makes a decision as to whether to place the features representing its unique argument in the same units that are used to represent an embedded transitive’s subject or those used for its direct object. The decision rule is simple: the network picks that assignment of "deep grammatical relation" for the argument of the intransitive which produces the highest acceptability.

We have done very little tuning of or experimenting with this connectionist network to date, but the initial results are very encouraging. After training the network on all 8393 sentences and their acceptabilities using a revised version of the back-propagation learning algorithm, the network gets the sign of acceptability correct in all but 104 cases (1.2%), of which 90 involve embedded transitives (2.5%) and 14 involve intransitives (0.4%).

This account can be looked at in a second way, as a particular fragment of the grammar of French expressed within the Harmonic Grammar (HG) formalism (Legendre, Miyata, & Smolensky, in press). An HG account consists of a set of soft rules such as:

(17) If the argument of mourir "die" is a deep subject, then subtract 2.6 from the Harmony of the structure.

Each HG rule consists of a grammatical or lexical constraint, together with a numerical cost that is incurred when the constraint is violated: this cost is subtracted from the well-formedness or Harmony of the structure. Soft rule (17) can be paraphrased as follows: "Mourir prefers its argument to be a deep direct object (it is unaccusative), but this preference is not absolute: it can be overridden by preferences of other sentential elements, at a well-formedness cost of 2.6." The numerical Harmony values are interpreted as graded acceptability judgements according to an arbitrarily chosen conversion scale (e.g., Harmony values between about 0.4 and 1.4 correspond to ‘marginally acceptable’).

The HG account of these data involve soft rules like (17) corresponding to lexical entries in the syntactic approach to unaccusativity, and others corresponding to soft versions of syntactic conditions such as (7–10); there are also other soft rules that involve purely semantic conditions, and finally others that involve direct interactions between syntactic and semantic properties. And all these rules interact via the fundamental principle of HG:
Harmonic principle
Assign to an input the structural description with maximal Harmony.

Our account can be viewed in still a third way: as a higher-level description of a lower-level connectionist network governed by certain general connectionist representational and processing principles (for a full discussion, see Legendre, Miyata & Smolensky, 1990b). Central among these principles is one asserting that connectionist processing serves to build representations that maximize a certain numerical measure of well-formedness: Harmony (Smolensky, 1986). The central assumption of HG which links connectionism to grammar is that Harmony—the connectionist measure of representational well-formedness—can be interpreted at a higher level as a measure of linguistic well-formedness: acceptability. (For related harmonic approaches to phonology, see Lakoff, 1988; Goldsmith, to appear; Prince & Smolensky, in preparation.)

V. Summary

We have argued that neither the heavily syntactic nor the purely semantic approaches to unaccusativity can be adequate as universal theories of the phenomenon, since they each fail in major ways under detailed scrutiny within one particular language, French. We have described a unified account in which both syntactic and semantic factors figure into a grammar defined as a set of soft rules or quantified preferences. By sensitively handling the strong interactions of all these preferences, this Harmonic Grammar treatment is capable of accounting for the rich complexity exhibited within a substantial body of French unaccusativity data.

Notes

*Authors are listed alphabetically. Y. Miyata’s current address is: School of Computer and Cognitive Sciences; Chukyo University; 101 Tokodate, Kaizucho; Toyota, 470-03 Japan. We gratefully acknowledge: a Junior Faculty Development Award to GL from the Council on Research and Creative Work, University of Colorado; NSF grants IRI-8609599 and ECE-8617947, and a grant from the Sloan Foundation’s computational neuroscience program, to PS; and support of YM (and PS, in part) by the Optical Connectionist Machine Program of the Center for Optoelectronic Computing Systems, funded by NSF/ERC grant CDR-8622236 and by the Colorado Advanced Technology Institute.

1. The other tests are: cliticization of the embedded indirect object in causative faire constructions, parallel transitive structures, auxiliary selection, nominalizations, and stativity (see Legendre, 1989a, and on interpretation, Legendre 1989b).

2. The actual data is omitted here for lack of space; it is available in a longer version of this paper available to interested readers.

3. Postal (1986), Legendre (1990) discuss the occurrence of what they call true Impersonal Passive with unergative verbs. The fact that the construction is
restricted to a small subclass of unergatives that select a subcategorized complement makes it a non-productive test for unergativity.

4. *Aller*, however, selects the perfect auxiliary *être*, usually considered a sufficient test for unaccusativity (Legendre, 1989; Ruwet, 1989). *Aller* can be viewed as very weakly unaccusative.

5. Left to right, the lengths of the five bars show the proportion of verb/argument pairs of the specified type that, for a given test, were judged acceptable, marginally acceptable, indeterminate, marginally unacceptable, and unacceptable, respectively.

6. In the table on p. 60, Dowty lists the "for an hour" test as OK for accomplishments, but in the text (p. 56) he says that "accomplishment verbs take adverbials with for only very marginally." We adopted the conservative strategy of ignoring this criterion when defining accomplishment verbs. We tested Dowty's first criterion, non-stativity, with two specific tests described by Dowty (p. 55): the progressive and the imperative. We ignored this criterion, however, when defining achievement verbs, since it appears to be sensitive to the distinction between punctual and non-punctual verbs.

7. These constructions were the six unaccusativity diagnostics (1–5, 14), plus four of Dowty's criteria for defining the aspectual verb classes (the "for an hour," ambiguity with "almost," progressive, and imperative tests), plus another stativity test from Dowty (1979, p. 55), pseudo-clefting.

References


Figure 1. Proportions of verb/argument pairs characterized by several semantic/aspectual properties [rows] that are acceptable (white bars) and unacceptable (black bars) when embedded in six diagnosti-
c contexts [columns].

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>CR</th>
<th>PE</th>
<th>PA</th>
<th>RR</th>
<th>ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>61</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accomplishment</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>States</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undetermined</td>
<td>267</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Act+St</td>
<td>77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acc+Ach</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atelic</td>
<td>265</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telic</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actor</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergoer</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volitional</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>?Volitional</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonvolitional</td>
<td>213</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animate</td>
<td>195</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inanimate</td>
<td>160</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Syllabic Consonants in Chinese: Representation and Syllabification

Yen-Hwei Lin
Michigan State University

In the description of eight varieties of Chinese fanqie secret languages, Chao (1931) shows that syllabic nasals in the secret languages behave both as an onset consonant and a syllabic nucleus at the same time. In the Taiwanese secret language described by Li (1985), the syllabic nasals of the source syllables always surface as non-syllabic consonants in the coda position. Based on these facts, several analyses of Chinese secret languages propose that syllabic nasals have a doubly linked structure, as shown in (1).

(1) Representations of syllabic nasals in Chinese fanqie languages


<table>
<thead>
<tr>
<th></th>
<th></th>
<th>O=onset R=Rime</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
\| | / |               |
| m |   |               |

In Yip (1982) and Bao (1990), the syllabic nasal is suggested to occupy both the onset and the nucleus positions. In addition, a VC structure is proposed for Taiwanese syllabic nasals in Lin (1988, 1989). The doubly linked structure suggests that these syllabic nasals are structurally geminates. The questions to be addressed then are: (i) are Chinese syllabic consonants geminates? (ii) If so, is the geminate structure an underlying or surface representation? In this paper, I would like to argue that Chinese syllabic consonants are derived geminates. In the first section, I review why syllabic nasals are proposed to have a geminate structure in the analyses of Chinese fanqie languages. Section two suggests that Chinese syllabic consonants are not underlyingly marked as syllabic or long. Arguments for the proposal based on the distribution of high vowels/glides and that of syllabic/non-syllabic consonants are given in section three. In section four, I propose that the surface geminate structure of Chinese syllabic consonants is derived by rule. The final section discusses the representation of syllabic consonants in general.

1. Syllabic consonants in Chinese fanqie secret languages

Chinese fanqie secret languages are language games spoken by children, thieves and fortune tellers. In this section I will briefly review data from three Chinese fanqie languages (FLs) and the analyses given in Yip (1982), Bao (1990), and Lin (1989). (2) gives examples from the Kunshan Mo-pa language. (2.a.b.) show that in the derived disyllabic word, the first syllable contains the onset of the source syllable with a new rime [o], and the second syllable consists of the rime of the source syllable and an onset that has the opposite continuancy value from the source onset. The syllabic nasals in (2.c.d.e.) appear as an onset in the first syllable, and as a rime in the second syllable.
(2) Kunshan Mo-pa FL (Chao 1931, Yip 1982, Bao 1990)
a. mA --> mo-ma --> mo-pa 'mother'
b. təw --> to-təw --> to-ləw 'many'
c. m --> mo-mə --> mo-pm 'not'
d. n --> no-nn --> no-np 'you'
e. n --> no-nn --> no-kn 'five'

Similar behavior can also be observed in the Changzhou Məŋ-la language.

(3) Changzhou Məŋ-la FL (Chao 1931, Yip 1982, Bao 1990)
a. mA --> məŋ-la 'mother'
b. k --> kəŋ-ley 'enough'
c. m --> məŋ-ln --> məŋ-m 'matron'
d. m --> nəŋ-hn --> nəŋ-n 'five'

The Changzhou secret language splits the original syllable into two, and adds a fixed rime [əŋ] in the first syllable and a fixed onset [l] in the second. In (3.c.d), the syllabic consonants occupy both the onset position and the rime position in the FL forms.

Taiwanese syllabic nasals behave somewhat differently. (4.a.b.) show that in the Taiwanese FL, the rime of the source syllable together with a fixed onset [l] appears in the first syllable, and the onset of the source syllable occurs in the second syllable with a new rime [l]. If the source syllable has a [+consonantal] coda, the coda consonant appears in both syllables in the FL forms, as in (4.c.d.). The coda consonant in the second syllable is further changed to an alveolar nasal. The examples in (4.e.f.) show that the syllabic nasals become codas and exhibit similar patterns as the coda consonants in (4.c.d.) do.

(4) Taiwanese FL (Li 1985, Lin 1988, 1989)
a. be --> le-bi 'buy'
b. təw --> law-təi 'head'
c. kəm --> lam-kim --> lam-kin 'sweet'
d. an --> lan-n --> lan-in 'red'
e. m --> lm-im --> lm in 'no'
f. təŋ --> ln-təŋ --> ln-tn 'sugar'

Both Yip (1982) and Bao (1990) treat FL formation as reduplication but propose different rule systems. In either approach, syllabic nasals have to be doubly linked to two skeletal slots. In Yip’s analysis, the consonantal melody of the syllabic nasal is linked to both the C and V slots. The derivation is shown in (5).
Yip's (1982) analysis of Kunshan Mo-pa FL formation

a. The skeleton: CV CGVC The melody: m

\[ \begin{array}{c|c|c}
0 & 0 & \\
\hline
CV & CGVC & \rightarrow \text{mo-mp}\n\end{array} \]

Bao (1990) proposes a different mechanism but also requires the syllabic nasal to be doubly linked. In this model, the whole syllable is reduplicated first. Then in the first syllable, the rime is replaced with [o], and in the second syllable the onset undergoes dissimilation. The sample derivation is given in (6.d.).

Bao's (1990) analysis of Kunshan Mo-pa FL formation (Bao 1990)

a. Total copying of the source syllable

b. In the first syllable, replace the rime with [o]σ

c. (i) In the second syllable, replace the value of [continuant] in the onset with the opposite value. (ii) [æcontinuant] --> [ævoice]

d. O R (a) O R O R (b,c.) O R O R

X X ----> X X X X ----> X X X X ----> mo-mp

\[ \begin{array}{c|c|c|c|c}
\ \ / & \ \ / & \ \ / & \ \ / & \ \ / \\
\hline
m & m & m & m & m
\end{array} \]

(7) is an analysis of the Taiwanese FL following Yip's reduplicative model. Assuming that syllabic nasals in Taiwanese can be linked to either the nucleus or the coda, Lin (1989) proposes a right to left association and allows the syllabic nasal to surface as a coda consonant. The derivation is given in (7.e.).

Lin's (1989) analysis of the Taiwanese FL


c. ø epenthesis  d. Place features delinking and default coronal insertion

e. melody copying  association/epenthesis

\[ \begin{array}{c|c|c|c|c|c|c|c|c|c}
\ | & i & | & i & | & i & | & (d.) & \mid
\hline
CGVX & CVC & \rightarrow & CGVX & CVC & \rightarrow & \text{le-m-in}
\end{array} \]

It appears that evidence from the secret languages supports a geminate representation for syllabic consonants (8.a.). It is interesting to note that in the model of moraic phonology proposed in Hayes (1989), both geminate consonants and syllabic consonants have the same moraic structure, as shown in (8.b.).
Such a theory then predicts that syllabic consonants may be considered to be geminates. If these Chinese syllabic nasals do have a geminate representation, are they underlyingly represented as such? We now examine if geminate structure is the underlying representation for Chinese syllabic consonants.

2. Chinese syllabic nasals in underlying representation

Several possible underlying forms can be posited to reflect the surface contrast of syllabic and non-syllabic consonants. (9) gives three common ways to indicate the contrast. As shown in (9.a. b.), a syllabic consonant may be represented as a CV or VC sequence or underlyingly marked as the syllabic nucleus. The moraic representation in (9.c.) is ambiguous in that it could mean (9.a.) or (9.b.), or maybe both.

(9) Possible underlying representations of Chinese syllabic and non-syllabic C's

<table>
<thead>
<tr>
<th>a.</th>
<th>b.</th>
<th>c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV/VC</td>
<td>CV</td>
<td>C</td>
</tr>
<tr>
<td>X</td>
<td>μ</td>
<td></td>
</tr>
<tr>
<td>\ /</td>
<td>\</td>
<td>\</td>
</tr>
<tr>
<td>m</td>
<td>m</td>
<td>m</td>
</tr>
</tbody>
</table>

We now briefly examine how underlying syllabicity and length contrasts are marked in Hayes' (1989) version of moraic theory.

(10) Hayes 1989

<table>
<thead>
<tr>
<th>a.</th>
<th>b.</th>
<th>c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contrastive long &amp; short V's</td>
<td>Contrastive short V's and glides</td>
<td></td>
</tr>
<tr>
<td>μ = /i:/</td>
<td>μ = /i/</td>
<td>μ = /i/</td>
</tr>
<tr>
<td>i</td>
<td>i</td>
<td>i</td>
</tr>
<tr>
<td>m</td>
<td>m</td>
<td>m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>d.</td>
<td></td>
</tr>
<tr>
<td>Contrastive long &amp; short C's</td>
<td>Syllabic and non-syllabic short C's</td>
<td></td>
</tr>
<tr>
<td>μ = /mm/</td>
<td>μ = /m/</td>
<td></td>
</tr>
<tr>
<td>m</td>
<td>m</td>
<td>m</td>
</tr>
</tbody>
</table>

Hayes proposes that if there is a long and short vowel contrast in a language, then the long vowel has two moras, while the contrasting short vowel receives one mora (10.a.). In a language where short vowels and glides contrast, the representations for vowels and glides would be like (10.b.). (10.c.) shows the contrast in long and short consonants. As mentioned by Hayes, syllabic consonants may have the same moraic structure (10.d.) as geminate consonants.

In this moraic model only when moraic structure is employed contrastively would there be underlying moras assigned to segments. Specifically, Hayes states,
If (a) the distribution of high vowels and glides is predictable, (b) there is no vowel length contrast, and (c) there are no geminates, then underlying forms may consist simply of segmental strings, with all moras inserted by rule. (1989:259)

The moraic theory proposed by McCarthy and Prince (1987) also retains only distinctive information in underlying representation. The crucial assumption is that redundant information should be minimized in underlying representation. With this assumption, I suggest that Chinese syllabic consonants have the underlying structure (11) like regular consonants.

(11)  X or
     /m m/

That is, the surface syllabic consonant is not an underlying geminate, nor is it underlyingly marked as a syllabic nucleus. In the following, I will first show that, just like the distribution of high vowels and glides, syllabicity of consonants is also predictable in Chinese. I will then account for why these syllabic consonants have a geminate structure on the surface.

3. Distribution of syllabic and non-syllabic consonants

In most Chinese languages, the maximal syllable structure is CGVX, in which C is a [+cons] consonant, G is a glide, and the coda segment can be a glide or a true consonant.

(12)  Chinese syllable structure  (C) (G) V (X)
     C: [+cons], G: glide, V: nucleus, X: [+cons] or glide

As the examples in (13) show, the high vowels have predictable alternations with high glides. If there is only one high vowel in the morpheme, then a vowel appears. If the high vowel is adjacent to another vowel that is more sonorant, for instance, a low or mid vowel, then the high vowel surfaces as a glide.

(13)  a.  /i/  /u/  /tin/  /tun/  c.  /ai/  /tei/  /au/  /tou/  
     [i]  [u]  [tin]  [tun]  [ay]  [tey]  [aw]  [tow]

     b.  /ia/  /ua/  /kua/  /cia/  d.  /iau/  /uai/  /tiou/  /huei/  
     [ya]  [wa]  [kwa]  [çya]  [yaw]  [way]  [tyow]  [hwey]

Another aspect about Chinese syllable structure that is relevant here is that in most Chinese languages the so-called 'zero' onset syllables, i.e., the vowel initial syllables, in fact have onsets. As shown in (14. a. b.), the vowel initial syllables have an onset phonetically. It also applies to syllabic consonants. On the surface, Chinese syllable structure should be C(G)V(X).
(14) **Obligatory 'zero' onset** (Chao 1948, 1968; F. Li 1966, Duanmu 1990)

<table>
<thead>
<tr>
<th></th>
<th>/i/</th>
<th>/u/</th>
<th>/m/</th>
<th></th>
<th>/an/</th>
<th>[yan], [yan], [yan], [Han]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>[yi]</td>
<td>[wu]</td>
<td>[mn]</td>
<td>b</td>
<td>[yan]</td>
<td>[yan], [yan], [yan], [Han]</td>
</tr>
</tbody>
</table>

That is why some analyses maintain that for every Chinese vowel initial syllable, there is an empty C slot in underlying representation, which will be filled in by melodic spreading as in (15.a.) or by insertion as in (15.b.).

(15) a. CV ---> CV  
    i  i  
    ! || ! || !

b. CVC ---> CVC  
    a n  ? a n  
    i  i  
    ! || ! || !

(16) a. V ---> CV  
    i  i  
    ! || ! || !

b. VC ---> CVC  
    a n  ? a n  
    i  i  
    ! || ! || !

(16) is another possible analysis where the C slot for an onset is inserted. We will assume the insertion schema in (16); however, we are not concerned about which analysis is better. The main point is that the vowel initial syllable /i/ is not doubly-linked in underlying representation even though it is doubly linked on the surface.

Consider now the underlying representations given in (17).

(17) a. *XX  * XX  b. *N  *μ  c. ? XX  N  μ  

<p>| | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>/</td>
<td>/</td>
<td></td>
<td></td>
<td>/</td>
<td>/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>m</td>
<td>i</td>
<td>i</td>
<td>m</td>
<td>m</td>
<td>m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Since there is no length contrast in Chinese, the underlying geminate structure as in (17.a.) should be rejected. The underlying marking of syllabicity for high vocalic segments in (17.b.) is redundant because the distribution of high vowels and glides is totally predictable. Several studies on syllabification and underspecification have shown that if syllabicity of a segment is predictable, then pre-associated nucleus need not be present in underlying representation. Within this framework, the most common treatment of the predictable vowel/glide alternation is that a vowel and its corresponding glide have the same representation, and it surfaces as a glide when it is not syllabified as the nucleus of a syllable. Therefore, an underlying high vowel is not assigned a mora or marked as syllabic. The question now is whether or not we should have a distinct representation for Chinese syllabic consonants, for instance, like any one in (17.c.).

If we look at the distribution of syllabic and non-syllabic consonants within a morpheme, we find that a consonant is non-syllabic when it is adjacent to a vowel, e.g., [ma] [pan]. If there is no vowel in the morpheme, a syllabic consonant appears, e.g., [mm], [tn]. Such a predictable distribution is very similar to that of high vowels and glides. This fact leads us to believe that syllabic and non-syllabic consonants, like high vowels and glides, have the same underlying representation.

More evidence comes from alternations. Alternations between syllabic and non-syllabic consonants are also predictable under affixation and contraction. Examples from various Chinese languages are given in (18-21). In Pingyang, the er suffix is...
a velar nasal. This suffix becomes a coda consonant in (18.b.) when it forms one syllable with the stem. If it is not contracted with the stem, it surfaces as a syllabic consonant, as shown in (18.c).

(18) **Pingyang er suffixation and syllable contraction (R. Li 1963)**

<table>
<thead>
<tr>
<th>stem</th>
<th>plain er-form</th>
<th>diminutive er-form (disyllabic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. η</td>
<td>li:η</td>
<td>'son, child'</td>
</tr>
<tr>
<td>b. bi</td>
<td>bi η</td>
<td>'plum'</td>
</tr>
<tr>
<td>c. tœ</td>
<td>tœ:η</td>
<td>'comforter'</td>
</tr>
<tr>
<td>d.</td>
<td></td>
<td>'knife'</td>
</tr>
</tbody>
</table>

Taiwanese syllable contraction in (19.a.) shows that after contraction and reassyllabification, the original high vowel becomes a glide. In the same fashion, the syllabic nasal in (19.b.) alternates with the non-syllabic coda nasal.

(19) **Taiwanese syllable contraction (Cheng 1985)**

<table>
<thead>
<tr>
<th>stem</th>
<th>diacritic</th>
<th>Plain form</th>
<th>Syllabic form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. hit</td>
<td>tan</td>
<td>si --&gt; hyan si</td>
<td>'then, at that time'</td>
<td></td>
</tr>
<tr>
<td>b. tsa</td>
<td>hŋ</td>
<td>--&gt; tsaŋ</td>
<td>'yesterday'</td>
<td></td>
</tr>
</tbody>
</table>

Examples from Pingding in (20) demonstrate that the retroflex lateral is syllabic if it stands alone; if it is inserted into a syllable and adjacent to a vowel, it is nonsyllabic.

(20) **Pingding er infixation (Xu 1981)**

<table>
<thead>
<tr>
<th>stem</th>
<th>er-form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td>'son, child' (syllabic retroflex lateral)</td>
</tr>
<tr>
<td>b.</td>
<td>tsh</td>
<td>tsh⁵ a</td>
</tr>
<tr>
<td>c.</td>
<td>xua</td>
<td>x⁴ a</td>
</tr>
</tbody>
</table>

(21) provides examples from Huojia where the alternation pattern between syllabic/non-syllabic consonants and that between high vowels and glides is the same.

(21) **Huojia Mandarin zi suffixation (He 1982, Lin 1989)**

<table>
<thead>
<tr>
<th>stem</th>
<th>zi-form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>pi --&gt; piou --&gt; pyow</td>
<td>('nose')</td>
</tr>
<tr>
<td>b.</td>
<td>l</td>
<td>l ou --&gt; l ow</td>
</tr>
</tbody>
</table>

If we do not have to posit different underlying forms for Chinese high vowels and glides, it seems that we do not have to for syllabic and non-syllabic consonants, either. Therefore, all these examples of phonological alternations support our hypothesis that syllabic and non-syllabic consonants are not contrastive and should have the same underlying representation. In moraic theory, we may add that if the distribution of syllabic and non-syllabic consonants is predictable, then no underlying moraic structure is posited for syllabic consonants.
4. Geminate structure

If Chinese syllabic consonants do not have underlying geminate structure, we have to account for the behavior of syllabic consonants in the secret languages where a geminate representation seems to be necessary. As mentioned earlier, most Chinese languages require an onset at the phonetic level. I propose that the geminate structure is derived by an addition of the onset followed by melodic spreading. The rule is formulated as in (22.b).

(22)

\[
\begin{array}{c|c}
\text{UR} & \text{Obligatory onset with spreading} \\
\hline
\text{a.} & \text{b.} \\
X & N \rightarrow O N \\
l & X \rightarrow X X \\
m & \text{\} /} \\\n\end{array}
\]

A secret language form is then derived from a fully syllabified morpheme where the onset is already in place. An example from the Kunshan Mo-pa language is given in (23). In this example, the consonant becomes doubly linked by rule (22.b.) before reduplication begins. In fact, in Bao’s analysis of fanqie languages, the morpheme must be syllabified before it undergoes FL formation since the structure descriptions of his rules have to refer to onsets and rimes.

(23) FL forms are derived from a fully syllabified string in Bao’s model

<table>
<thead>
<tr>
<th>R</th>
<th>N</th>
<th>O R</th>
<th>O R O R</th>
<th>O R O R</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>\rightarrow</td>
<td>X X</td>
<td>\rightarrow</td>
<td>X X X X</td>
</tr>
<tr>
<td>l</td>
<td>}/</td>
<td>}/</td>
<td>}/</td>
<td>l l l</td>
</tr>
<tr>
<td>m</td>
<td>m</td>
<td>m</td>
<td>m</td>
<td>m o p m</td>
</tr>
</tbody>
</table>

(24) gives evidence showing that rule (22.b.) applies to both high vowels and syllabic consonants. We can see that /i/ and /m/ have the same derivations when they undergo FL formation. Given such evidence, we suggest that the geminate-like structure of Chinese syllabic consonants results from the general syllable condition that requires an onset rather than from the underlying geminate representation.

(24) Kunshan Mo-pa FL

\[
\begin{array}{c|c}
\text{a.} & \text{b.} \\
i & \rightarrow \text{yi-yi} \rightarrow \text{yo-yi} \rightarrow \text{yo-tci} \\
\hline
m & \rightarrow \text{m-m-m} \rightarrow \text{mo-mm} \rightarrow \text{mo-pm} \\
\end{array}
\]

In Taiwanese, however, the syllabic nasal does not seem to be linked to the onset. As mentioned in section one, the previous analysis suggests that Taiwanese syllabic nasals are linked to the nucleus and the coda rather than to the onset and the nucleus. Bao’s rules for Taiwanese FL formation are given in (25). These rules are inadequate in deriving the correct FL form from a syllabic consonant. The derivation in (25) shows that if the nasal has a VC structure, rule (25.ii) does not apply since there is no onset to replace. The fixed [l] would fail to appear.
(25) **Taiwanese FL formation in Bao's model**

<table>
<thead>
<tr>
<th>m</th>
<th>--&gt;</th>
<th>lêm in</th>
<th>'no'</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>melody copy</td>
<td>(ii) in the first syllable replace the onset with [l]</td>
<td></td>
</tr>
<tr>
<td>(iii)</td>
<td>in the second, replace the nucleus with [i] (Bao 1990)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>copy</th>
<th>substitution</th>
<th>dissimilation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Co</td>
<td>N Co N Co</td>
<td>N Co N Co</td>
</tr>
<tr>
<td>\ /</td>
<td>--&gt;</td>
<td>\ / \ /</td>
</tr>
<tr>
<td>m</td>
<td>m</td>
<td>m</td>
</tr>
</tbody>
</table>

Even if we apply an onset insertion and spreading rule before reduplication and modify Bao's rules by adding epenthesis and resyllabification, the correct form still cannot be derived, as illustrated in (26). It appears that Taiwanese syllabic nasals do not function as an onset at all.

(26) **copy** | **substitution/epenthesis** | **resyll/dissimilation**

<table>
<thead>
<tr>
<th>O N Co</th>
<th>O N Co</th>
<th>O N Co</th>
<th>O N Co</th>
<th>O N Co</th>
<th>O N Co</th>
</tr>
</thead>
<tbody>
<tr>
<td>\ /</td>
<td>--&gt;</td>
<td>\ / \ /</td>
<td>--&gt;</td>
<td>\ / \ / \ / \ /</td>
<td>--&gt;</td>
</tr>
<tr>
<td>m</td>
<td>m</td>
<td>m</td>
<td>\ m</td>
<td>m</td>
<td>i</td>
</tr>
</tbody>
</table>

In order to solve the problem in Taiwanese, the phonetic forms of Taiwanese vowel initial syllables should be examined. (27) shows that there is no spreading when an onset is added. Instead, a glottal stop is inserted in all cases. The glottal stop is usually left out in the transcription of Taiwanese. For some speakers, the insertion of the glottal stop may be optional. The fact that there is no melodic spreading to the onset in Taiwanese helps explain why the syllabic nasals in the Taiwanese secret language do not function as an onset.

(27) **Taiwanese 'zero' onset**

a. /i/ --> [ʔi] [i]; /u/ --> [ʔu] [u]; /ia/ --> [ʔia] [ia]; /ue/ --> [ʔue] [ue]

b. /a/ --> [ʔan] [an]; /an/ --> [an] [ʔan]

I suggest that the VC structure for Taiwanese syllabic nasals is derived by the lengthening rule (28.b.). The proposed rule is based on the fact that in Chinese the nucleus in an open syllable is phonetically longer than the one in the close syllable, e.g., /pi/ --> [piː] vs. /pin/ --> [pin]. With some modification of Bao's rules, the correct FL form can be derived, as shown in (29).

(28) **Taiwanese:**

<table>
<thead>
<tr>
<th>optional [ʔ] onset</th>
<th>nucleus lengthening</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>b.</td>
</tr>
<tr>
<td>X</td>
<td>XX</td>
</tr>
<tr>
<td>l</td>
<td>l</td>
</tr>
<tr>
<td>m</td>
<td>? m</td>
</tr>
</tbody>
</table>
(29)  

<table>
<thead>
<tr>
<th>copy</th>
<th>onset addition/epenthesis</th>
<th>resyll/dissimilation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N         Co</td>
<td>N Co N Co</td>
<td>O N Co N Co</td>
</tr>
<tr>
<td>\ / --&gt;</td>
<td>\ / \ /</td>
<td>\ / l \ / l</td>
</tr>
<tr>
<td>m</td>
<td>m m m</td>
<td>l o m i m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>l o m i n</td>
</tr>
</tbody>
</table>

In sum, the surface geminate structure for Chinese syllabic consonants occurs as a result of lengthening. The lengthening rule is either induced by the requirement of an obligatory onset or general nucleus lengthening in an open syllable. That Taiwanese syllabic consonants do not function as an onset is because there is no melodic spreading to the onset in Taiwanese.

5. Conclusion and implications

In conclusion, syllabic and non-syllabic consonants are not contrastive underlingly in Chinese because their distribution is predictable from general syllabification. The surface geminate structure for syllabic consonants is derived by rule. The implication of this proposal is that in languages where the distribution of syllabic and non-syllabic consonants is predictable, the geminate-like behavior of syllabic consonants may occur as a result of a general condition on syllable structure or a general lengthening rule, but not because of a geminate-like underlying form.

A syllabic consonant is often considered to have a distinct underlying representation from its regular counterpart, e.g., CV vs C, and [+syllabic] C vs [-syllabic] C. In accordance with recent research on syllabification theory and underspecification, we maintain that syllabicity information of a syllabic consonant need not be coded underlingly unless there exists an underlying syllabic contrast, e.g., a minimal pairs like [m. bi] vs [mbi], or there is evidence based on phonological alternations.

The syllabic nasal /m/ in Gokana discussed in Hyman (1984) appears to be a consonant that has to be underlingly marked as moraic based on evidence from alternations. In (30), we can see that, unlike the syllabic consonants in Chinese, /m/ in Gokana surfaces as syllabic even if it is followed by a vowel. If the Gokana syllabic nasal is not moraic or underlingly syllabic, we would wrongly predict an output form like [bá mí] for (30.a.).

(30)  

<table>
<thead>
<tr>
<th>Syllabic nasals in Gokana (Hyman 1984)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.  bá + m + í --&gt; bá m mí</td>
</tr>
<tr>
<td>arm my this</td>
</tr>
<tr>
<td>b.  m + a --&gt; mí má</td>
</tr>
<tr>
<td>inside intr.</td>
</tr>
</tbody>
</table>

One interesting fact is that this underlingly marked syllabic consonant behaves like a geminate. In Hayes' proposal, the consonant melody of a geminate consonant is 'flopped' onto the following vowel-initial syllable.
(31) Geminate C's in Hayes (1990)

\[
\begin{array}{c}
\sigma & \sigma \\
\mu & \mu & \mu \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

<table>
<thead>
<tr>
<th>a t a</th>
<th>a t a</th>
</tr>
</thead>
</table>

[atta]

The syllabic /m/ in Gokana exhibits the same behavior.

(32)

\[
\begin{array}{c}
\sigma & \sigma \\
\mu & + \mu \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

\[
\begin{array}{c}
\mu & \mu \\
| & | \\
\end{array}
\]

m i m i

Furthermore, (33.a.b.) show that only the syllabic nasal gives the vowel initial suffix an onset, while a regular consonant does not. This contrast indicates that this syllabic /m/ may be a geminate. In fact, it is treated like a geminate in Hymen's theory since it is assigned two weight units.

(33) a. m + a --> m m a 'to fill (intr.)'
b. bìr - á --> bìrá 'become black'

Since underlyingly syllabic consonants seem to behave as geminates, I hypothesize that the underlying syllability contrast of consonants may suggest an underlying length contrast. That is, the Gokana /m/, for example, is not an underlyingly syllabic consonant but an underlying geminate consonant. If this is the case, then moraic phonology may be superior to the CV theory in that it suggests the connection between geminate and syllabic consonants by giving them the same representation. Whether or not underlying syllabic consonants are geminates is an empirical question, and we need more data to confirm this hypothesis. If this hypothesis proves to be true, then there may not be any underlying syllabic contrast but only a length contrast for consonants.

Notes

1 Fanqie languages are game languages that make use of the 'fanqie' principle. The fanqie principle is the traditional method used by Chinese lexicographers to mark the pronunciation of Chinese characters. The pronunciation of each character is represented by two characters, with the first one exemplifying the pronunciation of the initial consonant, the second, the rime and the tone.

References

McCarthy, J. and A. Prince (1987) "Quantitative Transfer in Reduplicative and Templatic Morphology" ms. University of Massachusetts, Amherst, and Brandeis University.
McCarthy, J. J. and A. Prince (1986) "Prosodic Morphology," ms., University of Massachusetts, Amherst, and Brandeis University, Waltham.
0. Introduction

This paper examines the nature of what I call the purposive and participial complex motion predicates. First, consider the sentence (1a).

(1) a  Taro wa  hon o  Kanda ni  kai ni  itta.
       Taro TOP  book ACC  Kanda GOAL  buy PURP  went
       "Taro went to Kanda to buy a book."

    b  Taro wa  [PRO  hon o  kai ni ]  Kanda ni  itta.
       Taro TOP  [  book ACC  buy PUR  ]  Kanda GOAL  went
       "Taro went to Kanda to buy a book."

In (1a), the verb of motion *itta* 'went' occurs adjacent to another verb *kai* 'buy' with the purposive marker *ni*. This sentence is superficially similar to a sentence with an independent purpose clause, such as (1b), which is roughly synonymous with (1a). As Miyagawa (1987) claims, however, (1a) exhibits some phenomena that suggest mono-clausality. That is, the complex *kai ni itta* 'went to buy' in (1a) functions as one predicate in this sentence. I will call this type of predicate the purposive complex motion predicate.

(2a) is an example of another similar complex predicate that I call the participial complex motion predicate.

(2) a  Taro wa  sono  hon o  gakkoo ni  motte itta.
       Taro TOP  the  book ACC  school GOAL  have went
       "Taro brought the book to the school."

    b  Taro wa  [PRO  sono  hon o  motte ]  gakkoo ni  itta.
       Taro TOP  the  book ACC  have school GOAL  went
       "Taking a book with him, Taro went to school."

In (2a) the -te-marked participial verb *motte* 'have', or more accurately 'come to have', appears adjacent to the main verb *itta* 'went'. The participial verb typically expresses the action or state of the moving object during its motion. This sentence is superficially similar to (2b), which involves an independent participial adverbial clause. However, as I will show later, (2a) exhibits the same kinds of mono-clausal properties that (1a) does, and therefore can be regarded as mono-clausal.2

The purpose of this paper is to discuss the lexical nature of these complex predicates. In doing so, I will also examine Miyagawa's (1987) restructuring account of purposive complex motion predicates, which I will show can also apply to participial complex predicates. I will show that the restructuring account
overgenerates many ungrammatical sentences, and further that the semantic and functional properties of these predicates suggest that they are more appropriately generated in the lexicon.

1. Evidence for mono-clausality and the restructuring account
1.1. Purposive complex motion predicates

Those facts that Miyagawa provides to argue for the mono-clausality of sentences like (1a) can be summarized in the following way. The first piece of evidence comes from scrambling. In Japanese an adverbial clause is an island with respect to scrambling, and elements in an adverbial clause cannot scramble with elements of a matrix clause (Saito 1985). (3b) shows that the phrases belonging to the embedded adverbial clause cannot scramble with the phrases from the main clause. All the NPs and PPs in (3a), on the other hand, can be freely scrambled, showing that they are all in the same clause. 3

(3a) Taro wa hon o Kanda ni jitensha de kai ni itta.
    Taro TOP book ACC Kanda GOAL bicycle INST buy PUR went
    "Taro went to Kanda to buy a book by bicycle."

b *Taro o hon o Kanda ni [PRO kai ni] jitensha de itta.
    Taro TOP book ACC Kanda GOAL buy PUR bicycle INST went

The second piece of evidence comes from the distribution of the Japanese particle shika that can be placed on various phrases. This particle occurs with a negative morpheme on the verb and gives the meaning of 'only' to the phrase it attaches to, like French que. The negative morpheme must occur in the same clause as the phrase with shika (Oyakawa 1975). Thus, (4b) is ungrammatical. However, (4a) is grammatical, showing that the sentence is mono-clausal.

(4a) Taro wa Kanda ni sono hon shika kai ni ikanakatta.
    Taro TOP Kanda GOAL the book buy PUR go-NEG-PAST
    "Taro went to Kanda to buy the book only."

b *Taro wa [PRO sono hon shika kai ni] Kanda ni ikanakatta.
    Taro TOP the book buy PUR Kanda GOAL go-NEG-PAST

The third piece of evidence comes from the case marking of the object NP of some stative predicates. In Japanese, when a verb is suffixed with certain morphemes that make the verb stative, the object of the verb is marked in the nominative. For example, the object of the verb yomu 'read' is normally marked in the accusative, but when the verb is suffixed by the potential -rare or the desiderative -tai, it can be marked in the nominative. (5a) shows that when -tai is suffixed to iku 'go' in a sentence like (1a), the NP hon 'book' can be marked in the nominative.
This shows that the complex *kai ni iku 'go to buy' is one predicate. In a bi-clausal sentence like (5b), on the other hand, this is not possible.

Miyagawa (1987) uses these phenomena to argue for the existence of a syntactic restructuring rule in Japanese. Such a rule, he claims, converts a bi-clausal structure like (1b) into a mono-clausal structure like (1a) in the way described in (6). He claims that this rule applies in the mapping from D-structure to S-structure.

1.2. Participial motion predicates

Participial complex motion predicates also exhibit the same phenomena. First, the NPs and PPs in (2a) scramble freely with respect to each other. Second, the particle *shika can be placed on an NP associated with the participial verb with the negative morpheme on *iku 'go', as shown in (7a). (7b) shows that this is not possible with its bi-clausal counterpart.

Third, when the desiderative morpheme -tai is suffixed to the verb *iku 'go', the object of the participial verb can be nominative-marked, as shown in (8).
Thus, sentences like (2a) are also mono-clausal. Given the structural identity of (1a) and (2a) and also (1b) and (2b), it is natural to assume that the rule that generates (1a) also generates (2a). Therefore, one might derive sentences like (2a) also by restructuring.

The use of a restructuring rule, however, is an undesirable solution in GB, since it produces structures that violate the requirements of the Projection Principle. Therefore, the use of such a rule must be carefully evaluated. In this regard, it is not entirely clear why the use of such a rule is preferred over base-generation of a mono-clausal structure, to account for the complex predicates under discussion. No evidence has been presented as to why sentences like (1a) must be analyzed as bi-clausal at D-structure, although there is evidence for analyzing them as mono-clausal at least at S-structure.

2. Constraints on possible argument structures

In fact, a close examination of purposive and participial complex motion predicates suggests that the structural restructuring account encounters serious problems. The first problem is overgeneration. First, consider (9a) and (9b).

(9) a Taro wa [hana ni mizu o yari ni ] beranda ni itta.
   Taro TOP flower DAT water ACC give PUR balcony GOAL went
   "Taro went to the balcony to give water to the flowers."

   b *Taro wa hana ni mizu o beranda ni yari ni itta.
   Taro TOP flower DAT water ACC balcony GOAL give PUR went

   c Taro wa hana ni shika mizu o yari ni ikanakatta.
   Taro TOP flower DAT water ACC give PUR go-NEG-PAST
   "Taro went (out) to give water only to the flowers."

The restructuring account would produce sentences like (9b) on the basis of (9a). However, the sentence is unacceptable.

The reason for the unacceptability seems to be the violation of a constraint on possible argument structure of a predicate. In (9b), the complex predicate would have goal and recipient as its arguments. However, this is not allowed as the argument structure of a verb, at least in Japanese. That is, one can state (10) as a constraint on the form of argument structure of a verb, which also constrains the complex predicate that we are discussing.

(10) V *<.. recipient, goal ..>

One piece of support for this analysis comes from the acceptability of (9c). In this case, the goal argument of iku 'go' is not expressed, due to the process that some call unspecified argument deletion. With the goal argument deleted from the
list of arguments, the complex predicate can have a recipient argument without violating (10).

Similarly, the ungrammatical (11b) would be produced on the basis of (11a) by restructuring.

(11a) Marii wa [ PRO sono hon o migi-ude ni kakaete] gakkoo ni itta.
      Mary TOP the book ACC right-arm LOC hold school to went
      "Mary went to school, holding the book in her right arm."

b * Marii wa sono hon o migi-ude ni gakkoo ni kakaete itta.
      Mary TOP the book ACC right-arm LOC school to hold went

(11b) can be ruled out because of another restriction on possible argument structures. (11b) would have a predicate that has a location and a goal as its arguments. Such a verb does not exist at least in Japanese, and therefore one can say that Japanese has (12) as a constraint on argument structure of a predicate, which (11b) violates.

(12) $V$ *<... location, goal...>

Similarly, sentences like (13b) are ruled out because of (14).

(13a) Taro wa [PRO kozutsumi o Kobe made okuri ni] yuubinkyoku ni itta.
      Taro TOP parcel ACC Kobe to send PUR post-office to went
      "Taro went to the post office to send his parcel to Kobe."

b *Taro wa kozutsumi o Kobe made yuubinkyoku ni okuri ni itta.
      Taro TOP parcel ACC Kobe to post-office to send PUR went

(14) $V$ *<...goal, goal...>

These constraints on argument structure may well be a part of (a) more general condition(s) on argument structure (cf: Goldberg 1991). In any case, what is clear is that the complex motion predicates are sensitive to the same constraints placed on lexical items.

3. Other "lexical" properties of complex motion predicates

The above problem of overgeneration might be solved by some revision of the restructuring account. One might say that the restructuring of constituent structure is somehow accompanied by the restructuring of the argument structure of a verb, and this process is constrained by the general conditions on argument structure that apply both in the lexicon and syntax. However, these complex predicates exhibit further lexical properties that cannot be explained by structural restructuring and argument restructuring. These complex predicates essentially have full semantic and functional properties of lexical items.
3.1. Semantic properties
3.1.1. Semantic differences

The complex predicates under discussion exhibit semantic properties of lexical items. Earlier, I said that these complex predicates are roughly synonymous with their bi-clausal counterparts. However, there are many kinds of subtle differences in meaning. Consider the following two sentences.

(15a) Taro wa suutsu o Meeshiizu to Emporiamu ni kai ni itta.
Taro TOP suit ACC Macy's and Emporium GOAL buy PUR went
"Taro went to Macy's and Emporium to buy a suit there."

b Taro wa [ PRO suutsu o kai ni ] Meeshiizu to Emporiamu ni itta.
Taro TOP suit ACC buy PUR Macy's and Emporium GOAL went
"Taro went to Macy's and Emporium so that he could buy a suit."

The difference is this. (15a) entails that both Macy's and Emporium are Taro's intended locations of buying a suit, whereas (15b) simply means that Taro's trip to Macy's and Emporium was made with the intention of buying a suit. Therefore (15b) is acceptable, for example, when Taro intended buy a suit at one of the two stores, going to the other just to compare prices. (15a), on the other hand, is not acceptable in such a case, but suggests that Taro had an intention to buy a suit at both stores (i.e. he wanted to buy two different suits). Thus, the goal argument of a complex predicate must be the intended location at which the action described in the purposive verb is performed.

The goal argument of the complex predicate must also be the location where the intended action is performed immediately after the termination of motion. Consider (16a) and (16b).

(16a) Taro wa [ PRO ichigatsu kara hajimaru myuuji karu o mi ni ]
Taro TOP January from begin musical ACC watch PUR
kurisumasu-kibun de ippai no Nyuu yooku ni itta.
Christmas-feeling with full GEN New York GOAL went.
"Taro went to a New York filled with Christmas atmosphere, in order to see a musical that was to begin in January."

b. Taro wa ichigatsu kara hajimar u myuuji karu o
Taro TOP January from begin musical ACC
kurisumasu-kibun de ippai no Nyuu yooku ni mi ni itta.
Christmas-feeling with full GEN New York GOAL watch PUR went.
"Taro went to a New York filled with Christmas atmosphere to see a musical that was to begin in January (right after arrival)."

(16a) is true when Taro went to New York to stay over there till January, when he intended to see a musical. (16b), on the other hand, is not true under such
circumstances; it entails that Taro intended to see a musical right after getting to New York, and therefore it implies that Taro went to New York during the Christmas season by mistake.

These two observations about the purposive complex predicates suggest that these complex predicates denote such motion that the intention described by the purposive verb accompanies all stages of the motion, and the intention is accomplished with the ending of the motion. In this sense, the motion of the subject NP and its intention must be more closely related in the meaning of a complex predicate than in the corresponding bi-clausal structure.

Similarly, observe the following difference with respect to participial complex predicates.

(17a) Taro wa sono suutsukeesu o kooban ni motte itta.
     Taro TOP the suitcase ACC police-station GOAL have went
     "Taro brought the suitcase to the police station."

b Taro wa [ PRO sono suutsukeesu o motte ] kooban ni itta.
     Taro TOP the suitcase ACC have police-station GOAL went
     "Taking the suitcase with him, Taro went to the police station."

(17b) is true even when Taro just happened to take a suitcase with him when going to a police station, while (17a) is acceptable only when Taro intentionally took a suitcase with him in going to the police station. Thus, the motion of the subject NP and the action or state accompanying it must also be more closely related in the meaning of a participial complex motion predicate than in the corresponding bi-clausal structure.

This kind of difference can be attributed to the general difference between lexical and phrasal expressions. As has been pointed out in regard to the difference between the verb kill and the phrase cause to die, different aspects of the event described by one lexical item must be closely related to each other spatially and temporally, in order to be packaged into the meaning of a lexical item (e.g. Wierzbicka 1972, Chap 5).

This point can be further illustrated by the possible semantic relations that a participle can mark in a bi-clausal structure and in a complex predicate. In the case of participial complex motion predicates, participles can mark only three kinds of semantic relations with respect to the main verb. They are what I call resultative, progressive and perfective, which are illustrated in (18).4

(18a) Taro wa sono hon shika gakkoo ni motte ikanakatta.
     Taro TOP the book school GOAL have go-NEG-PAST
     "Taro brought only the book to school."

b Taro wa sono otoko shika kooen made otte ikanakatta.
     Taro TOP the man park to chase go-NEG-PAST
     "Taro chased only the man to the park."
c Taro wa sono hon shika nusunde ikanakatta.
   Taro TOP the book steal go-NEG-PAST
   "Taro stole only the book and went away."
   (i.e. Taro left with only the book.)

The resultative reading involves verbs that denote a change of state of the subject NP, such as motsu in (18a), which is an inchoative verb meaning 'come to have'. In this case, the complex predicate denotes that the resulting state of the change holds during the motion of the subject NP. The progressive reading involves verbs that denote some activity that can accompany the motion of the subject NP, such as ou 'chase' in (18b). In this case, the complex predicate denotes that the activity described by the participle accompanies the motion of the subject NP. The perfective reading involves verbs that denote any activity that does not entail any change of state of the subject NP, such as nusumu 'steal'. In this case, the complex predicate denotes that the activity has finished just before the motion of the subject NP begins. As I will show shortly, such an activity must be interpreted as affecting the motion of the subject NP.

Participial adverbial clauses can mark some other meanings. For example, they can mark reasons, as in (19a).

(19)   Taro wa [ PRO sono shinbun-kiji o yonde ] (koko ni) kita.
   Taro TOP the newspaper-article ACC read here GOAL came
   "Taro read the newspaper article and (that's why he) came."

   b. Taro wa sono shinbun-kiji shika yonde konakatta.
   Taro TOP the newspaper-article read come-NEG-PAST
   "Taro came here, having read only the newspaper article."
   ("He read only the newspaper article to come here.")

Such a reading is not possible with the corresponding complex predicate in (19b). The closest reading is the perfective reading, which requires a closer relationship between the two events described by the participle and the main verb. (19b) is used only when reading a newspaper article was some sort of prerequisite for coming (e.g. it was part of a homework assignment for class).

3.1.2. Idiosyncrasies

Furthermore, some complex motion predicates have acquired idiosyncratic meanings. Some examples are given in (20).

(20) asobi ni iku 'go to play' > 'drop in (at someone's house)'
    tonde iku 'go flying' > 'hurry'
    megutte kuru 'come travelling around' > '(e.g. a fortune) come (to someone)'
    tsuite iku 'go sticking to (something), follow' > 'keep pace with'
    motte iku 'go having, bring' > 'steer (the course of an event)
   (to some stage)'

Such an idiosyncratic meaning is not available in the corresponding bi-clausal
structure. This phenomenon is typical of lexical items, and these meanings must be listed in the lexicon.

3.2. Functional properties

The complex predicates under discussion also exhibit functional properties of lexical verbs (properties related to grammatical functions such as subject, object and adjunct).

3.2.1. Passivization

Perhaps the most convincing evidence against the restructuring account is the passivizability of these predicates. In (21a), for example, the complex predicate motte iku 'go having' or 'bring' is passivized. (21b) is an example in which the complex predicate tori ni kuru 'come to take' is passivized.

(21)a  sono hon ga motte ik-are-ta (koto).
the book NOM have go-PASS-PAST
"(the fact that) the book was taken away."

b  kono hon ga mada dare ni mo tori ni kor-are-te inai (koto)
this book NOM yet anybody by even take PUR come-PASS ASP-NEG
"(the fact that) this book has not been claimed."

If one assumes a lexicalist theory in which all function changing processes take place in the lexicon, these complex predicates must be generated in the lexicon.

3.2.2. Adjunct interpretation

The final observation comes from adjunct interpretation. First, consider (22).

(22)a  Taro wa [PRO yakkuri hon o yomi ni] isoide toshikan made itta.
Taro TOP slowly book ACC read PUR hurriedly library to went
"Taro hurriedly went to the library to read a book leisurely."

b  #Taro wa yakkuri hon o isoide toshikan made yomi ni itta.
Taro TOP slowly book ACC hurriedly library to read PUR went

The restructuring rule would generate (22b) from a structure like (22a). However, while (22a) is a meaningful sentence, (22b) is not. This means that the complex predicate behaves like a simple lexical item with respect to the interpretation of adverbs. That is, two adverbs of the same type cannot modify different components of the verb.

(23) further shows that an adjunct PP interpretation treats a complex motion predicate as a lexical item. While (23a) is ambiguous between the two readings (Marii to issho ni 'with Mary' modifying the purposive verb, or the verb of motion), (23b) is unambiguous, with the reading of Mary sharing Taro's intention to borrow a book as well as accompanying him to the library.
(23)a  Taro wa Marii to issho ni sono hon o toshokan made kari ni itta.
       Taro TOP Mary with the book ACC library to borrow PUR went
       "Taro went to the library to borrow the book with Mary."

b  Taro wa [ Marii to issho ni [ hon o kari ni ]] toshokan made itta.
       Taro TOP Mary with book ACC borrow PUR library to went
       "Taro went to the library to borrow a book with Mary." (ambiguous)

In this respect, these complex predicates are different from Japanese morphological causatives. In contrast to (23a), (24) is ambiguous.

(24)  Taro wa Biru ni Marii to issho ni sushi o tabe-sase-ta.
       Taro TOP Bill DAT Mary with sushi ACC eat-CAUS-PAST
       "Taro forced Bill to eat sushi with Mary." (ambiguous)

In this sentence, Mary can be either a companion of Taro’s forceful action, or of Bill’s experience. Evidence like this has been used to support a bi-clausal structure for morphological causatives at some abstract level of representation, though they are mono-clausal in the surface constituent structure. The difference between (23a) and (24) shows that one cannot say that (23a) is bi-clausal in the same way (24) is.

3.3. Summary of Section 3.
All of the observations above suggest that the purposive and participial complex motion predicates have the functional and semantic properties of lexical items. One might save the restructuring account by adding various conditions on restructuring. This would put various subtle semantic conditions on syntax, but these are exactly the kind of conditions that the theory in which the restructuring account is proposed has tried to eliminate from syntax. Furthermore, such conditions cannot explain idiosyncrasies and passivization facts. Given that no evidence has been presented that forces us to assume a bi-clausal D-structure, it is better to say that sentences like (1a) and (2a) are base-generated as mono-clausal.

4. Categorial status of the complex predicates
There is, however, a problem with calling the complex predicates under discussion lexical items. In spite of their semantic and functional similarities to lexical items, the complex predicates do not have the categorial status of lexical items, for they do not satisfy various tests for the categorial lexical status proposed in Poser (in press) and Matsumoto (1990). For example, the complex predicates do not undergo so-called Renyoukei Nominalization. Also, various emphatic and focusing particles like wa and nanka can intervene between the two verbs composing a complex predicate as shown in (25).

(25)a  Taro wa sono hon o Kanda made kai ni wa itta ga, ....
       Taro TOP the book ACC Kanda to buy PUR FOC went though
       "Although Taro did go to Kanda to buy a book, ...."
b Taro wa sono hon o gakkoo made motte wa itta ga, ....
Taro TOP the book ACC school to have FOC went though
"Although Taro did bring the book to school, ...."

Interestingly, such a particle can intervene even when passivization has applied, as in (26).

(26) Sono kodomo wa gakkoo made tsurete wa ik-are-ta ga, ......
the child TOP school to take FOC go-PASS-PAST though
"Although the child was brought to school, ...."

This mismatch between functional and semantic status versus categorial status is not limited to complex motion predicates. Poser (in press) claims that so-called incorporated *suru* verbs in Japanese, such as *benkyoo suru* (study do) 'study', are in fact two lexical items categorially, although they function as one predicate functionally.

Thus, the lexicon needs to contain this kind of non-lexical small phrase anyway, and therefore there is no reason to assume that the complex predicates that have been examined here are not generated in the lexicon in a similar way.

5. Concluding remarks

In this paper, I pointed out that the purposive and participial complex motion predicates exhibit semantic and functional properties of lexical items as well as properties related to their argument structures, although they are not lexical items categorially. These phenomena suggest that base-generation is a better solution than restructuring, providing a caution against the use of such rules in general.

In the theory of Lexical Functional Grammar, the above observations can be captured by saying that these complex predicates correspond to two terminal nodes in a mono-clausal constituent structure and to one slot in the mono-clausal functional and argument structures (cf: Butt, Isoda & Sells ms). A more explicit account, however, must be left for another occasion.

Notes

1. In writing this paper, I would like to thank the following persons for their valuable comments on this study: Elizabeth Owen Bratt, Joan Bresnan, Mary Dalrymple, Chuck Fillmore, Yoko Hasegawa, Kyoko Hirose, Michio Isoda, Peter Sells, Yoshiko Sheard, Seiko Yamaguchi, and Shuichi Yatabe. Of course, none of them are responsible for any shortcomings found in this paper.

2. This is not the only kind of the complex predicate composed of a participial verb and a verb of motion. In (i) below, *kuru* 'come' is used to refer to the abstract motion of the effects produced by Taro's action. In (ii), it marks the gradual progress of a change. See Yoshikawa (1976) for some facts about these cases.

(i) Taro wa soko ni hu o utte kita.
Taro TOP there LOC pawn ACC put came
"Taro placed a pawn there (with some effect to the other person)."


(ii) Sora ga kuraku natte kita.
    sky NOM dark become came
    "It is getting dark."

3 Note that some sentences, such as (i) below, can be ambiguously assigned both a mono-clausal structure and a bi-clausal structure.

(i) Taro wa Kanda ni hon o kai ni itta.
    Taro TOP Kanda GOAL book ACC buy PUR went
    "Taro went to Kanda to buy a book."

In this sentence the object of the verb kai appears adjacent to it, and therefore this sentence can be interpreted as a bi-clausal structure like (1b) with a purposive clause (PRO hon o kai ni), or a mono-clausal structure like (1a) in which the three phrases Taro wa, Kanda ni, and hon o happen to have scrambled in this order. I will not use this kind of sentence in the following discussions.

4 These three readings are essentially the same as the meanings that -te can mark when it occurs with the aspectual verb iru.

References


1. Introduction

Phonological rules are usually conceived of as expressions \( A \rightarrow B / C \), specifying a context \( C \), a unique input \( A \), and a unique output \( B \). This familiar theory, though, is not entirely satisfactory because of facts like those in (1), from the Australian language Lardil:

(1) Underlying Nominative Accusative
a. /kela/ kela kelan 'beach'
   /wiτe/ wite witen 'inside'
b. /yalulu/ yalul yalulun 'flame'
   /yukaτpa/ yukaτ yukaτpan 'husband'
   /muɲ kumun ku/ muɲ kumu muɲ kumun kup 'stone axe'
c. /wik/ wιk wikin 'shade'
   /mɾa/ mɾa mɾin 'hand'

The accusative justifies the underlying form; the alternations of interest are in the nominative. The descriptive generalization is that the nominative is identical to the underlying form only for disyllabic words. Monosyllables are augmented in the nominative by adding \( a \) (1c); polysyllables are shortened by one syllable.

The analysis of these facts in Wilkinson (1988) relies on positing a disyllabic Minimal Word Constraint (McCarthy and Prince 1986) for Lardil. This constraint on phonological well-formedness stands apart from two context-free phonological rules, one of which deletes a final vowel and the other of which inserts final \( a \). These rules apply under the aegis of the Minimal Word Constraint. Final vowel deletion applies only when its output would be well-formed under the constraint, therefore only in words of three or more syllables. Insertion of \( a \) applies only when it is required to satisfy the Minimal Word Constraint, therefore only in monosyllables.

This account of Lardil separates the contexts of the rules from the structural operations that the rules perform. A real generalization over the contexts of two different rules is thereby achieved: both are subject to the disyllabic minimum. Perhaps the earliest constraint-based approach of this type is Kisseberth's (1970) study of conspiracies, but there has been a burgeoning of interest in recent years, including among others Liberman (1975), Liberman and Prince (1977), Goldsmith (1976), McCarthy (1979), Cairns and Feinstein (1982), Prince (1983), Selkirk (1983), Kaye and Lowenstamm (1984), Kaye, Lowenstamm, & Vergnaud (1985), McCarthy (1986), Clements (1988), Yip (1988), and Prince (1991). Works that present specific theories of the mechanism and interplay of constraints and rules include Singh (1987), Paradis (1988), Myers (1991), and Goldsmith (1990).1

There's a particular consequence of a constraint-based theory that has not previously been noted. In cases like Lardil, greater generality is achieved by relating the context of a rule to broader conditions on well-formedness. But a constraint-based theory provides another possible opportunity for generalization: the structural operation of the rule. Within the standard theory, the contexts of rules and their structural operations are inextricably linked. As a result of this, the structural operations of rules are necessarily directional: \( A \) becomes \( B \). Once the context of the rule and its structural operation are separated, though, we can conceive of some rules as nondirectional statements: "\( A \) alternates with \( B \)" , expressing a generalization over the rules "\( A \) becomes \( B \)" and "\( B \) becomes \( A \)". Whether \( A \) or \( B \) is the outcome is left up to the separately-stated constraints. This is what I mean by synchronic rule inversion.

2. Rule Inversion and Eastern Massachusetts \( r \)

The evidence of synchronic rule inversion comes from a close examination of the distribution of \( r \) in the English dialect spoken in Eastern Massachusetts. Insertion and deletion of \( r \) are classic shibboleths of this dialect, very familiar to other American English speakers. The data in (2) are typical contrasts and alternations in this dialect:2

---

2. The evidence of synchronic rule inversion comes from a close examination of the distribution of \( r \) in the English dialect spoken in Eastern Massachusetts. Insertion and deletion of \( r \) are classic shibboleths of this dialect, very familiar to other American English speakers. The data in (2) are typical contrasts and alternations in this dialect.
(2)  

a. The spa seems to be broken.  
   [spa]  
   He put the tuna near the table  
   [tuwnd]  
   The boat tends to yaw some.  
   [yɔ]  

b. **Intrusive r**  
   The spa is broken.  
   [spar]  
   He put the tuna on the table.  
   [tuwndr]  
   The boat tends to yaw a little.  
   [yɔr]  

Deletion of r before a consonant or pause is exemplified on the right in (2a), leading to merger of spa and spar. Merger in the opposite direction takes place in a prevocalic context, as (2b) shows. Traditional descriptions distinguish between the nonetymologic intrusive r on the left in (2b) and the etymologic linking r on the right in (2b).

We will soon examine the other facts surrounding (2) in great detail, but until then it will be helpful to establish some basic pretheoretic observations. Deletion of r takes place whenever an r would be expected to occur preconsonantally or utterance-finally. Conversely, linking r is preserved whenever a vowel follows within the same utterance. Intrusive r is found whenever one of the vowels a, ə, or ɔ would otherwise be followed by a vowel in the same utterance. These conditions on the distribution of r have a straightforward syllabic basis that has been noted by many analysts (Vennemann 1972:216, Johansson 1973:60, Kahn 1976:109, Mohanan 1985:146). In the coda of a syllable, r is deleted. Resyllabification by the Onset Rule (Steriade 1982, Itō 1989) takes place within the utterance, so prevocalic r will be in onset position and hence not deleted. Intrusive r resolves hiatus within an utterance. The vowels that precede intrusive r (a, ə, ɔ) are just exactly the non-diphthongal word-final vowels. With diphthongal final vowels (seeing [si:l] versus sawing [sɔ:ln]), there is no hiatus and therefore no intrusive r.

The use of the term "utterance" in describing the distribution of r is intentional; linking r and intrusive r are not sensitive to any syntactic distinctions (cf. Vogel 1986). Thus, only pause, which delimits utterances, is relevant to the r alternations. It follows, then, that linking r and intrusive r are obligatory word-externally (conferral, withdraw[r]al), in various types of clitic groups (Timor-is, Cuba[r] is, law[r] of the sea), and in compounds and phrases (canola[r] oil, far-away, saw[r] Ed yesterday). So long as no pause intervenes, intrusive r and linking r are even obligatory across gaps (What did the dog gnaw[r] after dinner?), the boundaries of clauses or even sentences (The man that I saw[r] appears to have left), and between intonation phrases (Melissa[r], aren’t you coming?).

The history of this phenomenon is not entirely clear, although the general picture is known. A general weakening of r in syllable codas occurred by the seventeenth century and this led to loss of r by the end of the eighteenth century in parts of Britain and coastal America (Kurath 1972: 70). At this stage, the phonology would have been roughly as in (3):

(3) Stage I Eastern Mass. Phonology

Underlying Representations

```
/spɔ/  'spa'  /spɔr/  'spar'
/tuwnd/  'tuna'  /tuwndr/  'tuner'
/yɔ/  'yaw'  /yɔr/  'you’re'
```

Rule

```
r Deletion
   r → Ø / [C]
```

Speakers at this stage would be expected to have completed the merger in (2a) but not (2b). Intrusive r developed later, perhaps even in this century (Parslow 1967). Intrusive r in Britain and New England may very well be independent developments, which leads
to a major historical (and synchronic) puzzle: why is intrusive r a natural next step from a phonology like (3)?

Vennemann (1972) makes a specific proposal about this historical development, identifying it as an instance of rule inversion. Rule inversion is a process of historical change defined as follows (Vennemann 1972: 211-2):

(4) Rule Inversion

Stage I. Phoneme type A taken as basic. Rule: A → B / D  
Stage II. Phoneme type B taken as basic. Rule: B → A / D  
where U is the set of all possible contexts, D ∪ D′ = U, D ∩ D′ = ∅, and D′ is "that subset of D in which B and A still alternate".

Put simply, rule inversion is reversal of the input and output of a rule and complementation of the environment.

For Eastern Massachusetts r, the rule inversion scenario means that the Stage I phonology in (3) is replaced by a Stage II phonology like that in (5):  

(5) Stage II Eastern Mass. Phonology

Underlying Representations
/spə/ 'spa'  /spar/ 'spar'  
/tuwnɪ/ 'tuna'  /tuwnɪr/ 'tuner'  
/yər/ 'yaw'  /yuər/ 'you're'

Rule
r Insertion
Ø → r / V  V

At Stage II, the non-rhotic and non-rhotic underlying representations have been merged into non-rhotic ones. The rule of r Deletion has been inverted; instead of deleting r in coda position, the grammar now inserts r in hiatus. The phonology no longer contains a rule of r Deletion at all.

The question now is whether (5) is the correct synchronic analysis of the contemporary dialect, as the historical inversion account demands. Logically, we could imagine several other possible synchronic analyses, among them the historicizing analysis in (6) and the pure deletion analysis in (7):

(6) Historicizing Analysis

Underlying Representations
/spə/ 'spa'  /spar/ 'spar'  
/tuwnɪ/ 'tuna'  /tuwnɪr/ 'tuner'  
/yər/ 'yaw'  /yuər/ 'you're'

Rules
r Deletion
r → Ø / ______ C  r Insertion
r → r / ______ V

(7) Pure Deletion Analysis

Underlying Representations
/spər/ 'spa'  = 'spar'  
/tuwnɪr/ 'tuna'  = 'tuner'  
/yər/  'yaw'  = 'you’re'

Rule
r Deletion
r → Ø / ______ C

Both of these accounts deny historical inversion. The former sees r Insertion as just another rule added to the phonology, with the status quo maintained intact. The latter presupposes that the underlying representations were reanalyzed in the opposite direction and that the rule system did not change.

It seems clear that the absolutely historical analysis in (6) cannot be correct synchronically (cf. Johansson (1973), Pullum (1976), and Kahn (1976)). No internal evidence of the kind available to language learners would justify an underlying distinction between spa and spar, which are homophones in all contexts. There are two types of nominally external evidence that might conceivably be recruited by language learners, the orthography and pronunciations from other dialects. But this does not seem to happen. When speakers from Eastern Massachusetts attempt to accommodate to "Standard American", they frequently produce hypercorrections like the notorious [kyuubər] for Cuba. Orthography might play a minor role (Gimson 1970), as in Whorf’s (1943)
claimed distinction between *baahing of sheep* and *barring the door* ([baθ?In] versus [bærIn]), though these are identical for me. Of course, the spelling of *r* in unfamiliar words is quite hopeless, like *hussah* for *hussar*, *hyler* for *hyła* (from Joos's interpolations on Whorf (1943)), and *fanacula* for *vernacular* (from an undergraduate term paper).  

Johansson (1973) and Pullum (1976) present many arguments for the superiority of the *r* Insertion analysis in (5) over the *r* Deletion analysis in (7). Most are obviously defective or too aprioristic to still be relevant. Three, though, are worth scrutinizing:

- In more careful speech, there is an option to have *i* in place of *r*: *far away is [fɔr ˈdweɪ] ~ [fɔ? ˈdweɪ].* Under (5), this can be thought of as an alternative consonant insertion rule. But insertion of *i* is needed independently, since it also occurs post-pausally, where *r* is impossible (away [*ʔdweɪ], *[r̥dweɪ]). The glottal stop inserted by this rule would of course trigger deletion in /fɔr ʔdweɪ/ under (7).
- Slower or more careful speech has fewer intrusive *r*’s. This means that the *r* Insertion rule applies more in faster speech, in conformity with the usual effect of speech rate on phonological rules. But it is unreasonable to assume that speech rate controls the application of *r* Insertion directly. Rather, speech rate and style have an obvious effect on phrasing and syllabification, and these determine either *r* Insertion or *r* Deletion.
- For RP, there are some reports of the absence of linking or intrusive *r* after another *r*: *emperor of Japan*. Under (5), this can be analyzed as a dissimilatory failure of *r* Insertion. This observation does not hold in Eastern Massachusetts nor is it widely reported in RP. If correct, it could just as well be a condition on Deletion as on Insertion.

Clearly, then, there are no empirical differences between (5) and (7). A feature-counting evaluation metric might prefer the shorter underlying representations of (5), but that is purely a matter of ink-saving. Both analyses have equally "long" underlying representations in the only way that counts: in both cases, there is massive redundancy in the shape of underlying forms. In (5), no underlying form ends in *r*; in (7), no underlying form ends in a vowel. We will now consider this problem in detail.

3. Analysis

We have established that there are no sound empirical reasons to prefer Insertion (5) over Deletion (7). In fact, there are very good empirical reasons to think that both (5) and (7) are really wrong -- wrong because they are incomplete characterizations of the competence of native speakers of this dialect.

The *r* Deletion analysis (7) is wrong because it does not explain why new words ending in *ə, ɔ, or ɹ* invariably require intrusive *r* before a vowel: *François*[r] is coming, *rumba*[r]ing, *subpoena*[r]ing, *guffaw*[r]ing, *baah*[r]ing of sheep, *blah*[r]er ‘more mediocre’, *schwa[r] epenthesis, *The Beqaaa*[r] in Lebanon.* Nor does it explain why intrusive *r* is transferred to other languages, as in the following examples from Jespersen (1909): Danish *lukke*[r] *op*, German *hatte*[r] ich, *sagt*[e]r* er. In brief, (7) is wrong because it has no way of enforcing insertion of *r*; it simply takes it for granted that all underlying representations end in *r* rather than a short vowel.

The *r* Insertion analysis (5) is wrong for a very similar reason: it doesn’t explain why new words that end in *ʃ* must lose that *ʃ* finally or before a consonant: *Notre Dame University, palaver, Oman, Ishtar, Kareem Abdul-Jabbar.* Nor does it explain why *r* deletion is transferred to other languages, as in Jespersen’s (1909) example from Danish: *det brændet ganske*[r] *op.* In brief, (5) is wrong because it has no way of enforcing the loss of *r*; it simply takes it for granted that no underlying representations end in *r*.

To sum up, the evidence of productive language use (loan words, foreign accent, and the like) shows that an analysis with just an *r* Deletion rule or just an *r* Insertion rule is incorrect. Both Deletion and Insertion must coexist in any adequate analysis. In this respect, the historicizing account in (6) is the best one. It is still unreasonable to set up distinct underlying representations for *spa* and *spar*, so of course there has been some reanalysis, but both rules are required in any case. Indeed, the choice of underlying
representations becomes relatively unimportant in the face of the coexisting Deletion and Insertion rules.\(^6\)

Evidence for coexisting Deletion and Insertion has so far come from "external" sources. As it happens, though, there is a great deal of internal evidence pointing to the same conclusion. Three basic classes of arguments will be presented. The first consists of all the various \(r/\emptyset\) alternations in Level I morphology, which require both Insertion and Deletion. The second involves word-level or postlexical alternations in syllables with glide-liquid codas. This directly argues for Deletion and in a more indirect way for Insertion. Finally, the facts of function words will provide a completely distinct argument for Deletion.

**Level I Morphology.** The examples in (8) all involve alternations with Level I suffixes in English:

(8) \(r\) With Level I Suffixes

- Homer [howm\(r\)] Homeric
danger [deyn\(j\)\(d\)]
dangerous
doctor [d\(o\)k\(r\)\(d\)] doctoral
major [mey\(j\)\(d\)]
majority
tartar [t\(a\)k\(r\)\(d\)] tartaric
mayor [mey\(d\)]
mayoral
sulfur [s\(o\)lf\(r\)] sulfuric
angular [\(\emptyset\)ng\(y\)\(d\)\(l\)]
angularity
meter [mi\(t\)\(r\)] metric
cylinder [sil\(l\)ind\(r\)]
cylindrical
prior [pri\(r\)\(y\)] priority
satire [s\(a\)tr\(r\)\(y\)]
satiric

Compare:

- algebra
- algebraic
- Inca
- Incaic
- orchestra
- orchestral
- idea
- ideal
- aroma
- aromatic
- anesthesia
- anesthetic

Examples like Homer/Homeric or doctor/doctoral are a good source of \(r/\emptyset\) alternations with the expected distribution: \(r\) before a vowel, \(\emptyset\) finally. The real interest of these examples comes from comparison with algebra/algebraic or orchestra/orchestral, which do not have \(r\) before the suffix. The most straightforward account of this is to set up underlying representations like /howm\(d\)\(r\)/ versus /\(\emptyset\)l\(d\)\(b\)\(r\)\(d\)/, with a contrast between the presence and absence of final \(r\).\(^7\) (Here and subsequently, underlying representations are abstract only in relevant aspects.) Thus, Level I suffixation provides limited evidence for an underlying etymologic contrast, though obviously this evidence won’t be available for all or even most words. With these underlying representations, we need both \(r\) Deletion, to account for prepausal/preconsonantal Homer, and \(r\) Insertion, to account for intrusive \(r\) in algebra[r] is my favorite subject.

Some of the examples in (8) can be recruited to make a different sort of argument for underlying final \(r\) and \(r\) Deletion. Level I derivatives of sonorant-final stems differ in whether the sonorant is syllabic or not:\(^8\)

(9)

a. Homer\(f\)
   Homeric
   atom
   atomic
   angel
   angelic

b. meter\(f\)
   metric
   cataclysm
   cataclysmic
   cycle
   cyclic

The standard account (Chomsky and Halle 1968:85) of this distinction is to set up underlying representations like /s\(\emptyset\)t\(V\)m/ versus /k\(\emptyset\)t\(d\)k\(l\)z\(m\)/. Epenthesis (or sonorant syllabification) applies to the latter when the final sonorant is otherwise unsyllabifiable.

The data in (9) establish a parallelism between final \(r\) and other sonorants, since they show the same pattern of alternations. To make sense of this parallelism, we require contrasting underlying representations /howm\(V\)\(r\)/ and /mi\(t\)\(r\)/. But these underlying representations presuppose \(r\) Deletion to get the prepausal surface forms of these words.

The strong verbs provide yet another kind of argument for coexisting Insertion and Deletion rules. The relevant examples appear in (10):
(10) Strong Verbs

a. draw draw[r]ing drew
   saw saw[r] a ... see
   hear [hiyd] heard [hrd]

b. swear, tear, bear ([sweyd])
   swore, tore, bore ([swowd])

The argument in (10a) hinges on the observation that the strong verbs alternate only in their vowels, not in their consonants. The r-less preterite drew indicates that draw does not have final r. Therefore the r of draw[r]ing must be inserted by rule. A parallel argument can be made for see/saw. Conversely, the preterite heard shows that hear has a final r, requiring a rule of r Deletion. The argument in (10b) is based on the observation that strong verbs are always monosyllabic (or iambic, with an unstressed prefix, like beseech). But r-less underlying representations of words like swear would necessarily be disyllabic and trochaic /sweyd/, like their prepausal surface forms, in violation of this exceptionless regularity. So this evidence requires r Deletion as well.

Another argument comes from syllabic r. Basically, we have to account for a consistent distributional regularity: syllabic r is possible only in stressed syllables. And we have to account for the alternations in (11): under Level I derivation which moves the stress or opens syllables, syllabic r alternates with a vowel or vowel-r sequence. The alternations in (11a) are between stressed r and unstressed Ə. The alternations in (11b) occur when a syllable containing syllabic r is opened at Level I.

(11) Syllabic r

a. [r]/[ə] Alternations
   conserve [kɔnsərv] conservation [kɔnsəveɪʃ(ə)n]
   pervert, [prvrt] pervert, [prvrt]
   err [ɛr] error [ɛrd]
   prefer [prəfər] preference [prəfərəns]
   deter [dətər] deterrence [dətərəns]
   defer [dəfər] deference [dəfərəns]

These alternations are quite easy to understand if we assume that surface syllabic r is derived from an underlying vowel-r sequence. Specifically, the rules in (12), which are almost commonplace in English phonology, will account for the alternations:

(12) a. Assimilation
   ν → r / ____r.
   [-low]

b. Reduction
   ν → Ə
   [-stres]

The assimilation rule changes a non-low vowel to syllabic r before tautosyllabic consonantal r. The effects of this assimilation are neutralized by vowel reduction in unstressed syllables, whence the data on the right in (11a). These rules presuppose rhotic underlying representations like /pɔrvərt/, and this entails the existence of the r Deletion rule to account for the absence of rhotic quality in the initial syllable of pervert. The rules proposed in (12) are evidently productive; they are transferred in speaking other languages and they are respected by loan words like Yassir [yæsə] and Sirhan [ʃræn].

In summary, the evidence of Level I alternations provides a variety of arguments for both r Deletion and r Insertion as well as a contrast between some rhotic and non-rhotic underlying representations. The tartar/algebra contrast requires both Deletion and Insertion. Syllabicity alternations in final sonorants (Homeric/metric) and syllabic r alternations establish the need for a Deletion rule. The strong verbs also require both Deletion and Insertion.

Before going on, it is proper to address one concern that is often raised about examples of this sort. Level I alternations are sometimes believed to be without evidentiary value. It makes no sense to deny them any usefulness as evidence, but certainly we should approach them with care. For example, as Kahn (1976) notes, there is irregular stem-allomorphy before some Level I suffixes (compare algebraic and
aromatic in (8)). This irregularity obviously weakens the argument for a final r in Homer, since Homeric could be just another stem allomorph. But this argument is not presented in isolation; it is buttressed by other evidence from phenomena of great regularity, some at Level I and some to which we now turn.

Syllabification of Liquids. Up to this point, we have only looked at r after simple nuclei. The behavior of r after diphthongal nuclei provides a very different sort of argument for coexisting r Insertion and r Deletion rules. As a prerequisite to that argument, we need to establish some simple results involving l.

The data in (13) show the Eastern Massachusetts treatment of word-final l after a diphthongal nucleus. Before a consonant or pause, a disyllabic pronunciation is required, as in (13a). (13b) shows that these same stems are monosyllabic when the l precedes a vowel within the utterance.

(13) Final l With Diphthongal Nuclei
a. Preconsonantally and Prepausally
   feel [fiydl]        fool        [fuwl]
   fail [feydl]        foal        [fowdl]
   file [feydl]        foul        [fawdl]
   foil [feydl]

b. Prevocally
   feeling [fiylən]    feel it      [fiyl ɪt]
   failing [feyln]     fail it      [feyl ɪt]
   filing [fayln]      file it      [fayl ɪt]
   fooling [fuwlən]    fool it      [fuwl ɪt]
   goalie [gowləni]    goal of      [gowl əv]

A trisyllabic pronunciation of filing [fɔydlən] is possible in much more monitored speech.

The schwa in (13a) is not underlying; instead, it is derived by a rule of epenthesis. Compare the epenthetic schwa in (13) with the underlying schwa in (14), which does not delete (except in very casual speech):

(14)
a. Preconsonantally and Prepausally
   ideal [ɔydiydl]
   betrayal [blytreydl]
   trial [trəydl]
   vial [vəydl]
   Lowell [lawdl]

b. Prevocally
   idealize [ɔydiydləriz]
   betrayal of [blytreydl əv]
   trial of [trəydl əv]
   vial of [vəydl əv]
   Lowell is [lowdl ɪz]

Because of this contrast between epenthetic and underlying schwa, trail = betrayal and reel = real are homophones, while trail of ≠ betrayal of and reeling ≠ realist are minimal pairs (mutatis mutandis).

These facts require an underlying distinction between monosyllabic forms like /riyl/ 'reel' and disyllabic ones like /riydl/ 'real'. This distinction is neutralized in (13) by a rule of epenthesis that takes a final VGl sequence to VGəl. Epenthesis does not apply to heterosyllabic sequences, as examples like (13b) and doilie [dɔyli]/*[dɔydi] show. Nor does it apply when the final consonant is less sonorous than l, so spine [spəyn] does not rhyme with disyllabic iron [əydn]. The epenthesis is an effect of a minimal sonority distance constraint on tautosyllabic clusters (Steriade 1982). A glide+liquid sequence presents too small a sonority cline. The l, then, cannot be syllabified with the preceding diphthong and schwa epenthesis applies instead. If the l is an onset, as it is in (13b), then of course epenthesis will not apply. A final nasal, as in spine, offers a steeper sonority cline, and so it is tautosyllabic with the preceding glide.

These results about l lead directly to an argument for underlying final r. Compare the data in (15) with the data in (13):
(15)  

a. Preconsonantally and Prepausally  

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
</tr>
</thead>
</table>
| fear | [fiył]        | sure          | [suwɔ]  
| pare | [pɛyɔ]        | four          | [fɔwɔ]  
| fire | [foyɔ]        | flour         | [fɔwɔ]  

b. Prevoically  

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
</tr>
</thead>
</table>
| rearing | [riyɔɾIn] | rear of      | [riyɔɾiɔv]  
| paring | [pɛyɔɾIn] | pare it      | [pɛyɔɾIt]  
| firing | [fɔyɔɾIn] | fire it       | [fɔyɔɾIt]  
| assuring | [duwɔɾIn] | assure it     | [duwɔɾIt]  

As with l, a trisyllabic pronunciation of words like firing is possible in more monitored speech.

In previous analyses with r-less underlying forms (Johansson 1973, Kahn 1976), words like fire are represented as [foyɔɾ]. The prevoical alternations in (15b) are derived either by an insertion of r in hiatus followed by schwa deletion ([foyɔɾ+In] → [foyɔɾIŋ] → [foyɔɾIŋ]) or by d → r directly. Either way, the analysis of (15) is unrelated to the analysis of (13). In fact, this account is wrong, since it is unable to distinguish the schwa of fire, which disappears prevoically, from the schwa that is preserved prevoically in examples like (16b):

(16)  

a. Preconsonantally and Prepausally  

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
</tr>
</thead>
</table>
| layer | [leyɔ]       | layer of      | [leyɔɾ ıɔv]  
| power | [pɔwɔɾ]      | power of       | [pɔwɔɾ ıɔv]  
| rumba | [ɾoɔmbɔɾ]    | rumba away     | [ɾoɔmbɔɾ ıɔvey]  
| Nashua | [nəsuwɔ] | Nashua is     | [nəsuwɔɾ ız]  
| Maria | [moɾiɔɾ]    | Maria is       | [moɾiɔɾ ız]  

b. Prevoically  

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
</tr>
</thead>
</table>
| layering | [leyɔɾIŋ]       | layer of      | [leyɔɾ ıɔv]  
| powering | [pɔwɔɾIŋ]     | power of       | [pɔwɔɾ ıɔv]  
| rumbaing | [ɾoɔmbɔɾIŋ] | rumba away     | [ɾoɔmbɔɾ ıɔvey]  
| Nashua | [nəsuwɔɾ ız] | Nashua is     | [nəsuwɔɾ ız]  
| Maria | [moɾiɔɾ ız] | Maria is       | [moɾiɔɾ ız]  

The examples in (16) closely parallel those with l in (14). As with l, we can exhibit homophones and minimal pairs like Leat = Leah versus Lear—is ≠ Leah[r] is or reat = rhea versus the rear—is ≠ the rhea[r] is, the latter essentially the same as Maria[r] is.

The evidence, then, indicates an underlying distinction between rear and rhea/Maria. Underlying monosyllabic rear cannot be [fiy], of course, since it is distinct from Rhee or re. The only other candidate monosyllabic underlying representation for rear is [fiy], distinct from disyllabic rhea [fiyɾ] or tri syllabic Maria [moɾiɔɾ]. Underlying fiy then undergoes schwa epenthesis, just as [fiy] does, in prepausal and preconsonantal position. In fact, the analysis of this epenthesis as an effect of minimal sonority distance entails precisely this generalization: l and r are identical in sonority and pattern alike in triggering epenthesis.

External evidence supports this account. Pig Latin forms respect the rules: ear [iย]; becomes ear-ey [iye], receiving the usual prevoical treatment. New words like Bashkir are pronounced [bɔʃkiy], with schwa and without r. My own experience with Arabic is that the rules are also readily transferred to a foreign language. In pronouncing at-waziir, I must guard against [woziy], while I might misperceive Arabic waziir as waziir.

This analysis leads us to an important conclusion about the structure of the phonology. The existence of underlying representations like /fiyɾ/ entails that the grammar contain a rule of r Deletion, since otherwise surface [fiy] could not be derived. Unfortunately, this phenomenon does not provide a comparable argument for r Insertion. The (near-)minimal triplet more, mowr, and Samoa illustrates the problem. These three words are identical in their prepausal/preconsonantal forms: [(sɔ)mowɔ]. Prevoically, more is monosyllabic (more of [mowɾ ıɔv]) and the others are disyllabic (mower is = Samoa is [(sɔ)mowɔɾ ız]). On this basis, we can justify an r-final underlying representation for more, but we cannot justify a distinction between, say, mower [mowɾıɔv] and Samoa [soɔma]. So, although there is proof of the need for r Deletion, there is no corresponding proof from these data of the need for r Insertion.
Function Words with \( r \). The final argument for the underlying status of \( r \) in Eastern Massachusetts comes from the complex paradigm in (17) and (18), which involves \( r \) alternations in the vicinity of function words. The data in (17) show what happens where a function word follows a "real" word. All the examples involve a vowel-initial function word, either basic (17a, b) or derived by deletion of an initial consonant (17c, d). I have also distinguished between the etymologic linking \( r \) of (17b, d) and the non-etymologic intrusive \( r \) of (17a, c).

(17) Lexical Word + Function Word

Underlying Vowel-initial Function Word

a. Intrusive \( r \)
   
   Yemen and Cuba[r] are ...
   
   Cuba[r] and Yemen ...
   ...accused Cuba[r] of ...
   ...put Cuba[r] on notice.
   ...put Cuba[r] in ...
   ...put Cuba[r] at odds with ...
   I saw[r] it.

b. Linking \( r \)
   
   Timor is ...
   
   Yemen and Timor are ...
   
   Timor and Yemen ...
   accused Timor of ...
   ...put Timor on notice.
   ...put Timor in ...
   ...put Timor at odds with ...
   You're it.

Derived Vowel-initial Function Word

c. Cuba[r] Was been ...

d. Timor Has been ...

Cuba[r] Had better ...

Cuba[r] Was ...
(faster speech)

Cuba[r] Will ...

Cuba[r] Would ...

It's Cuba[r] He wants to win.

I saw[r] Him.

I saw[r] They.

I saw[r] Her.

It's more blah[r] Who that.

It's farther they that.

The deletion of initial consonants in the function words in (17c, d) is accomplished by various rules inventoried in Zwicky (1970) and Selkirk (1972).

The data in (17) show that, before a function word, intrusive \( r \) and linking \( r \) are not distinguished. This is hardly surprising, since our original discussion of spa and spar made exactly the same point. Now consider the paradigm in (18), which shows sequences of the form function word + "real" word. Remarkably, there is a complete absence of intrusive \( r \) (18a), although linking \( r \) appears as expected in (18b):

(18) Function Word + Lexical Word

a. No Intrusive \( r \)
   
   He shoulda eaten already.
   *[\$uðð iy?ðn]
   Likewise wanna, coulda, mighta, oughta, hafta.
   I'm gonna ask him.
   *[\$yng gوذg askmð]
   
   Did you answer him?
   *[\$iyl dr ansðrm]
   Likewise should you, would you, could you.
   *[\$dr dr dr eyt]
   Quick to add to any problem.
   [tæ ad tæ dr eiy]
   Likewise reduced so, by.
   [tør ad tør dr eiy]
   It was quarter of eight.
   [kwɔtɔdr ə eyt]
   Why do Albert and you ...
   *[dɔr ɔlbɔt]
   the apples
   *[dɔr ɔpɔdlz]
   A minimal pair is provided by the contrast between \( r \)-less fulla apples ('full of apples') and \( r \)-full fuller apples = Fulla[r] apples ('apples from Fulla's orchard').
Now we can sum up the observations. Before a function word or a real word (17), linking r and intrusive r have exactly the same surface distribution. This is precisely what we expect. But after a function word (though not a real word) there is a split -- linking r (18b) but no intrusive r (18a). We would expect a schwa-final word like shoulda to take intrusive r, but it does not.

The surface contrast between (18a) and (18b) requires a parallel underlying contrast: underlying r-final function words like for, are, our, or or must be distinct from vowel-final ones like shoulda, wanna, or the. Furthermore, the existence of some underlying r-final function words entails the existence of an r Deletion rule, since this r is obviously lost before a consonant or pause: for Tom.

That completes the basic argument, but one detail remains: why, as in (18a), is intrusive r not found with function words? Later, we will attribute this to general properties of function words, but for now, we need to deal with an explanation suggested by Kahn (1976), who also first noted the facts in (18). Suppose that wanna is derived in the postlexical phonology from want to, which is underlying /wɔntuwhy/ with a final glide. The sequence want to eat, underlying /wɔntuwyait/, would not undergo r Insertion because there is no hiatus between to and eat at this point in the derivation. Later, after r Insertion has applied, reduction of unstressed function words (Zwicky 1970, Selkirk 1972) will apply to shorten /tuwy/ to [t].

This ordering solution runs into three insuperable problems. First, as Kahn notes, the analysis requires that all reductions happening at the beginning of function words precede r Insertion, but all reductions happening at the end of function words follow r Insertion. The data in (18a) show that the final reductions, including vowel shortening in wanna and deletion of v in coulda, would need to follow r Insertion. The data in (17c, d), on the other hand, show that the initial reductions, including deletion of h, w, and δ, must all precede r Insertion. This is an improbable coincidence, that typologically similar rules, sorted only by the position in which they apply, should have very different order of application.

Another problem with the ordering solution is that it interpolates one rule of great generality, r Insertion, between two sets of highly lexicalized and idiosyncratic rules of reduction. Evidence that the reduction rules are lexically idiosyncratic includes the following:

- Vowel shortening applies to you but not to I, he, she.
- Shortening of only the is optionally sensitive to a following vowel. (Other dialects differ.)
- Reduction of to takes place in normal speech, but reduction of so or by is restricted to much more casual speech.
- Formation of portmanteaus like wanna is restricted to a small set of verbs.9
- Deletion of δ applies to them, than but not they, then.

Ordering these lexically governed processes after a regular phonological rule like r Insertion is implausible and in fact inconsistent with most views of rule typology.

The final argument against the ordering solution comes from non-native speaker intuition. A colleague who has lived for many years in Eastern Massachusetts but does not speak the dialect reports very sharp intuitions about the contrast in (18). There are two possible explanations for this: (i) he has learned this detail of r Insertion from long residence among natives; or (ii) the distinction in (18) follows from something shared by all dialects of English or even by all languages. The first explanation is unlikely to be correct, since this same person has very poor intuitions about much more conspicuous properties of r Insertion, like whether it applies word-externally. But the second explanation is incompatible with the ordering solution, since the contrast in (18) is pure stipulation.10

4. Conclusion
We have now examined all of the relevant data, drawn from throughout the phonology of this dialect. The external evidence of loan words and foreign language transfer shows
that, whatever the shape of underlying representations, both \( r \) Deletion and \( r \) Insertion must coexist in the phonology. The internal evidence leads to the same conclusion. Arguments for \( r \) Insertion come from the Level I alternations in (8) and the strong verbs in (10). Arguments for \( r \) Deletion come from both of these plus sonorant syllabic alternations at Level I (9), syllabic \( r \) (11), glide-liquid codas (15, 16), and function words (18). It is particularly striking that so many arguments point to the need for \( r \) Deletion, the rule that is rejected by previous analysts like Johansson (1973), Pullum (1976), and Kahn (1976).

We can now draw some morals, beginning with a diachronic one. The evidence shows that the historically prior process of \( r \) Deletion was not replaced by its inverse \( r \) Insertion, but rather the two came to coexist in the synchronic phonology of this dialect. This means that there was no rule inversion in the sense of (4) because diachronic rule inversion is by definition replacement of the Stage I rule by the Stage II one, not coexistence.

In fact, scrutiny of the other examples of diachronic rule inversion in Vennemann (1972) and the subsequent literature casts doubt on the whole phenomenon. A recurring defect of these cases is that the inverse rule is nearly always morphologized. An example of this is Vennemann’s account of inversion in the English \( /\text{d}\text{a}n\) alternation. At Stage I, a rule of some generality deleted \( n \) preconsonantally. Inversion then took place, so at Stage II the rule inserts \( n \) prevocally, but only in the indefinite article. A rule that might have been phonological at Stage I is replaced by an undoubtedly morpholexical rule at Stage II. Klausenburger’s (1978) account of inversion in the history of French liaison is very similar.

But the very definition of rule inversion in (4) is predicated on the assumption that the rules at both stages are phonological. Inversion is defined on the schema of phonological rules, statements of the form \( A \rightarrow B \vert C \). It is unreasonable to suppose that morpholexical rules are constructed on this same schema, or, even if they are, that \( A, B, \) and \( C \) are units of the same type. For instance, Lieber (1980) proposes that allomorphs are listed in the lexicon and Vennemann (1974: 151, 153-4n) appears to adopt this view as well. If anything like this is correct, then rule inversion has nothing to do with rules at all -- it is just a matter of swapping one basic allomorph for another one and the entire definition in (4) is a category mistake. The problem is even more profound when the rule has been morphologized even before inversion, as in Vennemann’s example of Sanskrit palatal/velar alternations or his via-rule analysis of velar softening in English. Similar issues arise for other examples in the literature, including Fe?fe? Bamileke (Vennemann 1972), Chadic (Schuh 1972, Leben 1974), and Kamba (Hinnebusch 1974).11

Certainly \( r \) Insertion is not a morphologized version of \( r \) Deletion, but neither is it the result of the inversion mechanism in (4), because the rules coexist at Stage II. The conclusion, then, is that (4) does not characterize any real mechanism of historical change.

Still, this leaves us with an important question: how do we get from Stage I with \( r \) Deletion to Stage II with coexisting Deletion and Insertion? Why is this such a natural change that it seems to have happened independently in Britain and New England? My proposal is that the Stage II situation is actually a historical generalization of the Stage I situation and that is why the two processes came to coexist at Stage II. The basis of this generalization is what I referred to in the introduction as synchronic rule inversion.

Constraint-based theories of rule application, because they separate the context of a rule from its structural change, give us a new opportunity to generalize over structural changes. With the structural change divorced from the context, we can state synchronically inverse rules with symmetric structural changes: \( A \sim B \) ("\( A \) alternates with \( B \)") in addition to the familiar \( A \rightarrow B \). Separate well-formedness constraints determine whether \( A \) or \( B \) is the output of the symmetric rule.

The claim here is that \( r \) Deletion/Insertion is just such a rule: \( r \sim \emptyset \). The conditions on this rule are expressed by the constraints on syllabic well-formedness in (19):
(19)
a. Coda Condition
   *[VrX]q
b. Anti-hiatus Constraint
   *V1q

(19a) says that the output of $r \sim \emptyset$ is $\emptyset$ in the coda of a syllable, where $r$ is prohibited. (19b), on the other hand, expresses the condition under which the output of $r \sim \emptyset$ is $r$, to resolve hiatus. The choice between $r$ or $\emptyset$ is made straightforwardly, in satisfaction of the conditions in (19).\textsuperscript{12}

This interpretation of the synchronic situation gives a quite different perspective on the history. Prior to Stage I, there was a pan-dialectal weakening of $r$ in coda position. At Stage I in some dialects, this weakening led to $r$ Deletion -- formally, $r \rightarrow \emptyset$ under the constraint in (19a). But already at Stage I, the grammar contained some form of the constraint (19b) as well. This is because (19b) is just a special case of the universal Onset Rule (Steriade 1982, Itô 1989), which restricts or prohibits onsetless syllables. There is abundant evidence for the Onset Rule at Stage I. One obvious consequence is the resyllabification of linking $r$ in The spar--is. Another, more subtle consequence (from Ross (1972: 258n.)) is the exceptionless rule of prevocalic tensing and gliding (VV $\rightarrow$ VGV), which has the effect of completely eliminating hiatus in the Level I morphology.\textsuperscript{13}

It follows, then, that there was no real change in (19) between Stages I and II. The Stage I phonology already contains some form of the Onset Rule, the basis of (19b) and of the intrusive $r$ phenomenon. Therefore the only innovation at Stage II is the generalization of the asymmetric rule $r \rightarrow \emptyset$ to the symmetric rule $r \sim \emptyset$. This generalization is the only novel mechanism required to account for the diachronic problem of intrusive $r$ and thus for the remaining case of rule inversion.

One matter remains, however, that leads to a refinement of the synchronic analysis. Recall the data in (18), which show that function words do not have intrusive $r$. Although the Anti-hiatus Constraint (19b) is surely the historical basis for intrusive $r$, it cannot explain why hiatus is allowed after a function word. This suggests that a prohibition on hiatus is not the best solution here.

I will briefly sketch an alternative to (19b) that solves the problem of function words, and then I will provide more detailed justification for it. The proposal is that, instead of a constraint on syllable structure (19b), the phonology contains the following constraint on word structure:

(20) Word Structure Constraint
   *Vw

That is, vowel-final words are prohibited. This constraint is enforced when the category Wd first becomes available, at the end of Level I. It triggers insertion of $r$ in all vowel-final words like spa, tuna, or yaw. (Glide-final words like see or high already respect (20).) In the postlexical phonology, this final $r$ is subject to the Coda Condition (19a), so it must either be resyllabified as an onset (spa[r] is) or deleted (spa, spa seems). Underlying final $r$, required in a form like rear, receives exactly the same treatment in the postlexical phonology. Informal derivations proceed as follows:

(21)
Underlying
Level I Phonology
and Morphology
Word Level
(20), $r \sim \emptyset$
Level II Morphology, other rules

This approach may seem counterintuitive, since the Word Structure Constraint (20) is not surface-true and some $r$'s are inserted only to be deleted later (cf. Pullum (1976)). Still,
there is a great deal of convergent evidence for the plausibility of this account.

The Word Structure Constraint (20) is paralleled by similar constraints in other languages and even other English dialects. In Arabic (McCarthy and Prince 1990), stems are subject to (20), which holds exceptionlessly at a relatively abstract level of representation but not at the surface. The closest analogue to (20) in an English dialect is the "Bristol I", which is added after all final schwas (whether in hiatus or not), so area and aerial are homophones. In Southampton, r serves a similar role. In both cases, a plausible interpretation is a prosodic requirement that all words end in a heavy syllable (assuming α and β are long).

Only real words are subject to (20), not function words. Function words are not of the category Wd, and so they do not receive intrusive r. There are abundant precedents for the immunity of function words to constraints on word structure. Similar to (20) are constraints on minimal word size, which notoriously do not apply to function words (McCarthy and Prince 1990). In fact, English is an instance of this: function words of the form Cθ are possible, but real words are not, whence the idiosyncratic lengthening in CV monosyllables like spa (cf. Chomsky and Halle (1968: 214-6)). Function words can also differ from real words segmentally: real words in English begin with θ, never δ; function words begin with δ, never θ.

Nevertheless, there is one circumstance when function words are of the category Wd---when they are phrase-final (Selkirk 1984: 366). Under the assumption that phonological constituency is hierarchical and is imposed exhaustively (Selkirk 1986: 384), the edge of a phonological phrase must always coincide with the edge of a phonological word. Under exactly this condition, intrusive r does follow function words:15

(22)

I said I was gonna[r] and I did,
Did you[r] or didn’t you? [dijɔr]
We oughta[r] if we’re asked.
If you hafta[r], I’ll help.

These cases, where the strict layering of phonological constituents demands that function words like gonna be analyzed as Wd, provide striking confirmation for the claim in (20) that intrusive r is a Wd-final phenomenon.

The derivation in (21) demands that the Coda Condition (19a) not apply until the postlexical phonology, since r is inserted and preserved throughout the lexical and word phonology. There is ample evidence in support of this. It is required by the analysis of words like fear in (15), which presupposes that r is a candidate coda, blocked by minimal sonority distance. Closed Syllable Shortening in the lexical phonology (Myers 1987) also requires syllabification of r as a coda to account for alternations like heart/heard or sincere/sincerity. Stress assignment indicates that r codas make syllables heavy at Level I, providing further evidence that the Coda Condition is not enforced lexically.16

In other respects, the analysis follows well-established properties of English phonology. Final consonant extrasyllabicity is a necessary part of the whole system of lexical syllabification in English (Borowsky 1986). The point at which the category Wd becomes available is the Word Level of Borowsky (1986, 1990). The Word Level is the domain of many other dialect-specific rules in English. The constraint (20) presupposes prior application of the various tensing and diphthongization rules (to prevent intrusive r in glide-final words like see), all of which are part of the Level I phonology exclusively.

This completes the argument. Two main results emerge from this close study of r in Eastern Massachusetts. One is diachronic: rule inversion is not a mechanism of historical change. The other is synchronic: within a constraint-based theory, symmetric rules of the form A ~ B are possible. In fact, the whole of the r phenomenon for the fundamental role of prosodic well-formedness conditions in phonological structure.
Notes

*I am grateful to Michael Kenstowicz, Joyce McDonough, Jaye Padgett, Alan Prince, and Lisa Selkirk for help with this work. Thanks also to the members of Linguistics 793A for providing expository guidance.

1. Thanks to Alan Prince for bibliographic consultation.

2. Although I have consulted my own intuitions and observations throughout this work, most of what I say can be confirmed in other studies, including Whorf (1943), Trager (1943), Carlson (1973), Kahn (1976), Kurath and McDavid (1961), Thomas (1961), and Parslow (1967).

3. Vennemann (1972:216) actually proposes that there are three stages in the inversion of r Deletion:

   Stage I. \[ r \rightarrow \emptyset / V \quad \] in certain words

   Stage IIa. \[ \emptyset \rightarrow r / V \quad \] in certain words

   Stage IIb. \[ \emptyset \rightarrow r / V \quad \]

I disregard this complication, since it does not make sense. Stage I and Stage IIa have different grammars but produce exactly the same surface representations. It follows, then, that the next generation of language learners is no closer to Stage IIb for having parents at Stage IIa whose utterances are identical to those of grandparents still at Stage I. Therefore we might as well dispense with Stage IIa entirely. This has the additional advantage of eliminating the need for an otherwise unprecedented type of historical change, the generalization of a completely lexicalized rule (insert r in certain words) to a completely phonological one (insert r everywhere).

4. Vogel (1986: 58) presents a different kind of argument against the historicizing analysis in (6). In a phonology with both Insertion and Deletion, it is an accident that both rules specify the utterance as their domain. This argument is based on the assumption that any rule can specify any domain, which seems unduly pessimistic. In any case, the problem is easily resolved if Deletion and Insertion are syllabically conditioned and syllabification takes the utterance as its domain.

5. Transfer of r Deletion to other languages is an obvious feature of my accent when speaking German or Arabic. I have not noticed any transfer of r Insertion, perhaps because it requires greater fluency, which I lack, and because I take great care to use glottal stop instead.

6. Kahn (1976:115) concludes for very different reasons (having to do with lexically governed variation) that r Deletion and Insertion coexist in New York City speech. He sees the historical development as a result of external influence.

7. The significance of these examples has been noted previously by Johansson (1973), Pullum (1976), and Mohanan (1985).

8. Rubach (1977:23ff) and Borowsky (1986) are recent treatments of the phenomenon. Lightner (1983:93ff) gives a more than exhaustive list of morphemes showing the syllabicity alternation.

9. The parallel between contracted wanna and simple to in resisting intrusive r supports Pullum and Postal’s (1979: 696n.) position against a treatment of wanna as a relexicalized verb of some kind.

10. Although the evidence from the Eastern Massachusetts dialect is unambiguous, there is a report from Sivertsen (1960: 138) that Cockney has intrusive r with the indefinite article, which can be a prevocally in this dialect. But the same report also shows intrusive r in phrases like high[r] house or how[r] old, where intrusive r would be impossible in New England or RP. The intrusive r in Cockney may be a profoundly different phenomenon.

11. Vennemann (1972) presents another example of inversion where the Stage II rule is arguably phonological: vowel/zero alternations in English plurals, genitives, preterites, and so on. The proposed inversion here is from a syncope rule at Stage I to an epenthesis rule at Stage II. This case bears interesting similarities to the r/Ø alternation discussed in the text, but it has one major defect: there is no solid evidence for epenthesis over syncope in the synchronic phonology. Zwicky (1974) reviews the problem thoroughly; Borowsky (1987) is one recent treatment.
12. One might imagine an account of Eastern Massachusetts $r$ based on something like an empty C with default $r$. This is not a viable alternative, as evidenced by phenomena like (12) and (15), which show that $r$ has specified phonological properties even in the lexical phonology.

13. Ross (1972) refers to a paper "English Vowel Non-sequences" that evidently deals precisely with the topic of avoidance of hiatus in English. Apparently this paper was never published and I have been unable to obtain a copy.

14. Information on these dialects comes from Wells (1982: 344) and Hughes and Trudgill (1979: 32). The Bristol $l$ is heavily stigmatized, hardly surprising since all linguists feel compelled to repeat the jokes about a man with three daughters named Idle, Evil, and Normal, and about a dancer who said "I can rumble but I can't tangle".

15. Thanks to Lisa Selkirk for eliciting these examples from me.

16. Another indication that $r$ codas are found lexically comes from pre-$r$ vowel quality. In Eastern Massachusetts, there is a three-way contrast among hoarse [hos], loss [lɾs], and horse [hos] ~ [hɾs] (Laferriere 1979). The words hoarse and loss can have underlying representations identical to their surface representations; the problem lies in accounting for the variation in horse. If it is underlying /hɾs/, then the variation can be expressed by a rule sensitive to postvocalic $r$. But this account presupposes an $r$ coda in a position where it could not be extrasyllabic, before a syllabified final consonant.

Bibliography


Trager, G. L. (1943) "Comments on B. L. Whorf's 'Phonemic Analysis of the English of Eastern Massachusetts'," *Studies in Linguistics* 2, 41-44.
In the change in progress in San Francisco White English the front vowel /æ/ is distributing in two areas of vowel space, a lower, more centralized area and a higher, fronter one. The area of the low, less front phones realize one of the two allophones of /æ/ in the current phonology, that is, the alternant not in the nasal environment. The area of fronter and higher vowels realize the other alternant, /æː/ before nasals, hereafter /æːN/. Through apparent time low /æ/ before obstruents interacts less and less with /æːN/. This is because /æːN/ has tensed.

This paper reports on /æːN/ in the informal speech obtained from interviews with 14 white women, native speakers of English who grew up in San Francisco. Eight of these are grouped into four pairs, each of which has a working class and and middle class member, the youngest two are in their twenties, the next in their thirties, the next in their forties, and the oldest two are over sixty. These eight informants are the main group speakers. The remaining six speakers, all in their early thirties, are the supplementary group speakers. The findings presented here rely on plotted F1 and F2 measurements obtained for more than 70 vowels per speaker for the eight main group speakers and between 30 and 40 tokens from the speech of each of the supplementary group speakers.

When followed by a nasal consonant /æː/ fronts and raises. Fronting is more consistent than raising. An increase in both kinds of movement is observable through apparent time. The variation observable across speakers of different ages and between informants of approximately the same age is subject to linguistic and social constraints. It is possible to trace the phonetic course of a subphonemic change that has been producing the allophone /æːN/, /æː/ before nasals. The speech of younger informants shows that adults in San Francisco already have, or almost have, a complete allophonic distinction between /æː/ and /æːN/.

The variable (æN), then, represents the distribution and movement of part of a phonologically low front vowel phoneme. The variation that defines (æN) involves tensing of /æː/—N, which, by bringing some of the front low vowel forward, brings the lower front edge of vowel space forward for San Francisco White English. Vowel tenseness is a phonological phenomenon. It is not a matter of the presence or absence of one phonetically defined feature, nor a difference in degree of any one acoustic cue or articulatory gesture on some scale. Several cues are involved. The one with apparent priority is peripherality. The importance of peripherality is obvious in English phonology. Tense vowels are fronter than lax front vowel counterparts and backer than lax back vowel counterparts.

An examination of the vowel charts for main and supplementary group speakers shows the course of the development of complementarity, in so far as plotted F1 and F2 measurements reveal degree of frontness and height for vowel tokens. Charts for the eight main group speakers, given in Figure 1 on the next four pages, show total distributions for (æN) and for (æ) elsewhere. In the speech of the two oldest informants in the main group of speakers there is some fronting of (æN); (æN) overlaps greatly with all of the rest of /æː/. For the middle-aged speakers (æN) fronts more, overlapping less with (æ). For speakers in their early thirties (æN) is clearly in the process of separating from (æ), but there is still overlap between the areas. This is also the situation for 25 year old Beth
Meg Cork, 73

Marion Thompson, 65

(æN)

(æ)
Figure 1. Charts for the eight main group speakers showing distributions for (æ) and (æN) for working class and middles class older speakers, middle-aged speakers, speakers in their early twenties, and speakers in their twenties.
Thompson as well. For twenty-two year old Ginger Ryan (æN) has completely separated from (æ). All six of the supplementary speakers, in their early thirties, whose charts are not reproduced here, show separation of (æN) from (æ). The (æN) distributions suggest that /æN/ behaves more and more over time as a member of the subsystem of front vowels and participates little in low vowel activity; /æN/ has nothing to do, for instance, with the interaction of /æ/ before obstruents, as in cat, with the nearly merged low back /a/ and /o/, as in cot and caught. There are low front variants of (æN), but these are within a distribution that ranges front and up from low vowel space. Through apparent time variation involving (æN) can be seen to assume direction, carrying the nasalized vowels more and more forward and further and further up within front vowel space. Two movement rules are involved; the fronting rule has priority.

Examination of the data for evidence of lexical diffusion does not reveal any very good candidates for items that have conditioned tensing of the vowel more than others. But within the distribution of (æN) across age of speaker finer phonetic conditioning is found. The most extreme tensing—that is, fronting and raising together—is favored overall by a following alveolar environment. There are different fronting and raising orders, however, for variants in several environments, as shown in Table 1.

<table>
<thead>
<tr>
<th>WC</th>
<th>raising</th>
<th>MC</th>
<th>raising</th>
</tr>
</thead>
<tbody>
<tr>
<td>oldest</td>
<td>fronting</td>
<td>nT n#</td>
<td>raising</td>
</tr>
<tr>
<td>nT m</td>
<td>nT nT m</td>
<td>nT n#</td>
<td>m nT n#</td>
</tr>
<tr>
<td>nT nT m</td>
<td>nT nT n#</td>
<td>nT nT n#</td>
<td>n# nT m</td>
</tr>
<tr>
<td>nT m</td>
<td>nT nT m</td>
<td>nT nT n#</td>
<td>n# nT m</td>
</tr>
<tr>
<td>nT n#</td>
<td>nT m</td>
<td>nT nT m</td>
<td>nT n#</td>
</tr>
</tbody>
</table>

Table 1. Fronting and raising orders for (æN) in several environments for the eight main group speakers, oldest to youngest by class. (n# = (æN#); nT=(æN/d); m=(æN); nT=(æN)

Not every speaker produced enough tokens of the nasalized vowel in each environment for environmental centers to be calculated. Given the orders of the centers, it can be seen that (æ) before /n/ word finally varies with (æ) before /n/ plus /t/ or /d/ for highest position across age of speaker. (æ) before /m/ is least favored for fronting. The four speakers for whom (æ) before /m/ centers can be found keep the vowels relatively unfronted. It may be that the velar nasal encourages fronting the most, while keeping the vowel relatively low. The velar plosive also conditions fronting for (æ), so two constraints, place of articulation and nasality, are probably at work. Environmental constraints for fronting and raising have not reordered over time. The following ordering generalization can be suggested:

- fronting raising
- æn æn æm æm æη æη

(æm) is favored for neither fronting nor raising. (æη) tends to be front, but it is also kept low. (æη) is both fronted and raised; this makes it the most favored for tensing in general.

There is social embedding for the sound change. Correlation of phonetic behavior and SES index score of speaker is apparent only for the pronunciation of the nasalized vowels. Two features are involved: vowel height; and diphthongization. In San Francisco White English the tensing of /æ/ before nasals has been effected in such a way that it has been unnecessary for either class (to
dichotomize unrealistically) to change the realization of the nasalized vowels exactly in the direction of realization in the speech of the other class. An original higher position for \((\varepsilon N)\) for middle class speakers along with prioritizing of fronting over raising makes this so. The spread of SES index scores, determined by employing an index similar to the one used in Labov (1966), is given in Table 2. Given these SES scores, there is a break in the continuum on the class spread between Tracy Sawyer and Jean ORoark. Heuristically, the women with scores 8–11 are regarded as working class, and those with scores from 13.5–18 as middle class.

<table>
<thead>
<tr>
<th>Speaker Name</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ginger Ryan</td>
<td>8</td>
</tr>
<tr>
<td>Suzi Rockland</td>
<td>8</td>
</tr>
<tr>
<td>Meg Cork</td>
<td>10</td>
</tr>
<tr>
<td>Sharon Ryan</td>
<td>10</td>
</tr>
<tr>
<td>Carol Winter</td>
<td>10</td>
</tr>
<tr>
<td>Tracy Sawyer</td>
<td>11</td>
</tr>
<tr>
<td>Jean ORoark</td>
<td>13.5</td>
</tr>
<tr>
<td>Beth Thompson</td>
<td>14</td>
</tr>
<tr>
<td>Rachel Stone</td>
<td>14.5</td>
</tr>
<tr>
<td>Maureen Donovan</td>
<td>14.5</td>
</tr>
<tr>
<td>Jesse Austin</td>
<td>15</td>
</tr>
<tr>
<td>Barb Walsh</td>
<td>15</td>
</tr>
<tr>
<td>Marion Thompson</td>
<td>16</td>
</tr>
<tr>
<td>Nan Levine</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 2. SES index scores for the 14 speakers.

Charts for the dyads of elderly and middle-aged speakers show that class has determined a height difference for \((\varepsilon N)\) centers and distributional spreads for many decades. The height difference illustrated in Figure 1 was certainly established well before extreme fronting of \((\varepsilon N)\) began. The two middle class speakers center the \((\varepsilon N)\) distribution above but not in front of the obstruct environment distributions. For the working class speakers \((\varepsilon N)\) centers lower than some of the obstruct centers, as well as slightly in front; the center of \((\varepsilon N)\) has about a mid height position within the total low front vowel distribution. For the lower SES speakers the forward extension of \((\varepsilon N)\) is quite low, while for the higher SES women it is relatively high. Since tensing is primarily a fronting movement the older middle class informants Marion Thompson and Jean ORoark do not extend \((\varepsilon N)\) down and front, the older working class informants Meg Cork and Sharon Ryan do not extend \((\varepsilon N)\) up and front. Speech within one class is not adjusting to a position for \((\varepsilon N)\) determined by the speech of another class. Rather, the tensing rule, primarily a rule for peripheralizing \((\varepsilon N)\), applies in the phonology of all speakers.

From decade to decade fronting proceeds, accompanied by some raising. The raising appears to be processually secondary. Younger speakers all show \((\varepsilon N)\) centers to the front of the obstruct environment centers. Raising is found across class, but for middle class speakers this results in a further height separation of nasalized and nonnasalized vowel distribution centers, while for working class speakers a center for \((\varepsilon N)\) higher than for areas within \((\varepsilon)\) is quite recent. Extension of the distribution of \((\varepsilon N)\) up from a center increases over time. The two speakers in their twenties, Jennifer Ryan and Beth Thompson, show the highest extension of \((\varepsilon N)\) relative to the whole \((\varepsilon N)\) and \((\varepsilon)\) areas. For working class Suzi Rockland and Jennifer Ryan, both in their thirties, however, there remain quite low areas of \((\varepsilon N)\). Across class \((\varepsilon N)\) has moved forward and up, while keeping some of its distribution relatively low. The low area is lower for young working class speakers; at the same time, the high area for \((\varepsilon N)\) is higher for young working class speakers. There is a greater height range for \((\varepsilon N)\) for young lower SES speakers.
Middle class individuals are more likely than working class ones to diphthongize phones of the low front phoneme. In the sampled speech of the six working class women there are only three instances of diphthongization. The vowels in hand and understand glide back and slightly up for main group speaker Suzi Rockland and supplementary group speaker Carol Winter. Main group speaker Jennifer Ryan has a lowering inglide on the vowel in a particularly front instance of Tam. Seven of the eight middle class women diphthongize some of the vowels before nasals. For instance, main group speakers Jean ORoark and Jesse Austin have lowering inglides on vowels in can, and, supplementary speakers Rachel Stone, Barb Walsh and Nan Levine on panic, and, Jan; Levine has a raising inglide on the vowel in hand. Barb Walsh's chart is given in 4 on the handout. All of the glides used by middle class women are of some length, lowering F2 by 500-1000 Hz; and the vowels are quite long, in no case shorter than 300 msec. Across speakers of both classes, diphthongization is favored in the alveolar environment.

The process of increased tensing of (æN) through apparent time is the progress of a subphonemic sound change and therefore a process that results in the change of status for a rule (or rules). (æN) fronts and raises variably. Finally complementarity is established. A variable rule (or variable rules) accounting for the fronting and raising movements is either replaced by or exists along side of a categorical rule stating that before a nasal consonant /æ/ becomes tense. Description of the process, as seen in the drift of tokens through time, addresses the embedding, transition, and actuation problems. The embedding problem, as discussed in Weinreich, Labov, and Herzog (1968:100), is to locate change 'within the linguistic and social matrix governing its development', the transition problem to discover 'the route from one state of language to another' (p.101), and the actuation riddle to find 'how rule changes pass from an active to dormant state' (p.187). It is possible to place the tensing of (æN) within a linguistic context and, in a less detailed way, within a social context. The route in vowel space from untensed to tensed for (æN) is clear. It is not clear that the tensing process is finished phonetically; that is, it is not clear that a variable tensing rule is 'dormant'—(æN) can be further tensed. Tensing itself, however, is predictable. 'Actuation' of rule change, in the sense of the addition to the grammar of a statement describing a complementary distribution, has taken place or is in the final stage of coming about. The mechanism for the rule addition may or may not be a change in the status of the long-lived variable tensing rule or rules from variable to categorical; or, to put it another way, the addition of the allophonic rule may or may not be the result of variable rule loss. The same statement or set of statements accounting for tensing may have dual status: as categorical, describing complementarity; as variable, describing increasing tensing in all or some environments. The rule for allophony simply tenses /æ/ before nasals. The variable rule (or rules) front and raise the variable (æN) under several, differently weighted, constraints.

In formulating responsible sociolinguistic phonological statements about most synchronic or diachronic processes—that is, about processes more complicated than those involving phonemic distinction or complementarity due only to phonetic conditioning alone—it is necessary to inquire about at least four different kinds of possibilities. First, it is possible for a rule to be categorical or variable. Second, it is possible for conditioning to be phonetic, lexical, or both; or to be grammatical. Third, it is possible for variability to be socially or linguistically conditioned, or both. Social variability will have reference to speaker identity and to the level of formality of a speech situation. Phonetic and lexical linguistic
variability have been given more consideration than other kinds. If the variability is phonetic it is a matter of more frequent rule application in one environment than another, that is, of weighted phonetic constraints. Fourth, it is possible for a rule to change status in more than one way. Lexical conditioning may be lost, resulting in a rule that is entirely phonetically conditioned. Or, a rule may change from variable to categorical. At the end of a sound change a rule changes phonological status. A rule for changing an inventory or creating allophony—a rule describing shift, merger, split, or complementarity—is of a different phonological order than one describing, e.g., variable, conditioned vowel movement in which no change in the state of the phonology has been effected.

The movement of (æN) is embedded in the subsystem of front vowels, but it is also true that (æN) exists only in relation to (æ). The tensing of (æN), resulting in allophony, manifests a separation of (æN) and (æ). For younger speakers /æN/ is now maximally separated, phonetically, from /æ/. (æN) may continue to tense but, as far as securing the allophony goes, further fronting and raising would be inefficient. There is more room for expansion in front vowel space than in back, and (æN) has made use of it. Martinet's (1955) margin of security or safety margin, is a concept that has had reference to the maintenance or collapse of phonemic distinctions. But here a principle that it is functional to maintain a safety margin of empty vowel space may be operating subphonemically, for the development of allophony.

It may be that this reveals something about the mechanism of phonemic split. In White English in Philadelphia a tense collection of vowel phones has split from a lax collection for /æ/, resulting in tense /æh/ versus /æ/; the separation is phonemic and not simply allophonic because it is not simply phonetically conditioned. In San Francisco White English a collection of phones has been separating from a lax collection for /æ/, but the result is complementarity rather than contrast at this time because the phonetic conditioning is clear. Labov (n.d.) has referred to the tensed vowel /æh/ in Philadelphia as a 'marginal phoneme', by which he means that its status depends on only slight disturbance of a pattern of complementarity. The tensing of San Francisco /æ/ before nasals, the most favored environment for raising, exemplifies a stage in a process that logically leads to split, either by partial merger with a higher nasal allophone of a front vowel if tensing does not extend to other environments, or by the establishment of a new distinction if tensed /æ/ gains lexicon in some way other than through phonetic conditioning. I am not suggesting that split is predictable but that two preconditions for it have already been met: phonetic conditioning for allophony has developed; complementarity, reflected in separation between the distributions of (æN) and (æ) in phonetic vowel space, has been effected. What remains to happen is some disturbance to the complementarity, or partial merger of /æ/ with a higher vowel. The high, front phones of /æ/ have reduced the phoneme's margin of security in relation to nonlow front vowels drastically. There is also no margin of security between /æ/ (cat) and /æ/ (cot), and overlap is tolerated. The situation at present is one of maximal overlap of areas of confusability, to use Nunberg's (1980) term, between /æ/ and higher front vowels and between /æ/ and /æ/ and of minimal overlap of what I will call also areas of confusability between the two alternants of /æ/. I am suggesting that the separation in vowel space between the two allophones of /æ/ be regarded as the same sort of thing, phonologically, as separation of phoneme distributions, but relevant to a different level of the phonology.

The development of allophony for /æ/ is embedded socially within a continuum of class differences. Phonologically, the route from lack of allophony to
clear complementarity is one of fronting primarily and raising secondarily. Allophony is actuated by rule addition. The rule has been variable. Now tensing of /æN/ is categorical, although further tensing may continue, variably. Both categorical and variable versions of a tensing rule may be said to exist, the first describing that fact of complementarity. The achievement of categorical status for the tensing rule marks that a phonological change has already taken place. To say this, however, is simply to reify an observation that a process, tensing, now seems to consistently occur to a degree that maintains phonetic separation of the phones distributing as (æ) and those distributing as (æN). The reality of allophony can be said to have been effected at some point prior to consistent separation of (æ) and (æN) distributions across individuals, in the sense that 'free variation' can manifest complementarity. A linguistic perspective tying the phonetic detail of specific stages of sound change to phonological feats such as the accomplishment of allophony, split, or merger is the most obvious bottom-up approach to the problem of how one rule changes into another. This problem is 'the generative aspect of the transition problem' (Labov 1973:101).

Conditioning for the development of allophony is purely phonetic. Even fine phonetic conditioning by place of articulation of the nasal is discernible. The word class involved remains intact; no items are subtracted, no items are added. Differences in rule application for speakers under 35 suggests that the change has been a lexically intact wave. Within the tensing rule, in both its categorical and variable forms, there are differently weighted constraints determined by place of the nasal following the vowel. This phonetic variability interacts with socially governed variability. Class of speaker controls the height of the nasalized vowels before tensing and the use of glides. Further, level of formality, although not discussed in this paper, affects vowel realizations. The four different types of possibilities that should be considered—categorical or variable status of a rule, level of linguistic conditioning, type of variability, and kind of rule change—have been inquired about. The development of the allophone /æN/, a simply conditioned, categorical matter by one kind of account, can be seen as a process describable by a list of selections from several sets. There are categorical and variable rules tensing /æ/, involving linguistic conditioning that is purely phonetic, with linguistic and social variability.

References


Nominal 'Tautologies' in Japanese: $X$ wa $X$, $X$ ga $X$, and $X$ mo $X$

Shigeko Okamoto
California State University, Fresno

1. Introduction

So-called nominal tautologies such as Boys will be boys and Women are women may be said to lack informative import since they are true by virtue of their logical forms alone. Yet, it is well recognized that these expressions do convey meanings which are not readily transparent from their literal meanings. The question is, what are the meanings of these tautological expressions? What is the best way to describe them?

There are three main approaches to these questions. The first is what Wierzbicka (1987) calls "radical pragmatics." It is proposed by Grice (1975), Levinson (1983), Ward and Hirschberg (1991), and others; it assumes that tautologies are uninformative by themselves, but meaningful in context; their meanings are conveyed as implicatures (via a blatant violation of the Gricean maxim of Quantity), which are inferable pragmatically. For example, according to Levinson (1983: 125), Boys are boys is meaningless in the abstract, but could be used to "implicate something like 'that's the kind of unruly behaviour you would expect from boys.'" The second approach is "radical semantics" advanced by Wierzbicka (1987, 1988); it assumes that the meanings of tautologies, particularly attitudinal meanings, are conventional; that is, they are not inferable pragmatically and must be spelled out in rigorous semantic representations, such as follows:

(i) The form 'Nabstract is Nabstract' (e.g. War is war) expresses a 'sober' attitude toward complex human activities.
(ii) The form 'Npl-human are Npl-human' (e.g. Boys are boys) expresses tolerance for human nature.
(iii) The form '(art) N is (art) N' (e.g. A rule is a rule) expresses obligation. (Wierzbicka 1987)

The third approach is less radical than both approaches above. It is proposed by Fraser (1988) and Escandell-Vidal (1990). It assumes that tautological expressions have one conventional meaning, and that they may have additional pragmatic meanings which are calculable in context. For example, Fraser describes the conventional meaning of nominal tautologies as follows:

An English nominal tautology signals that the speaker intends that the hearer recognize:
(i) that the speaker holds some view towards all objects referenced by the NP;
(ii) that the speaker believes that the hearer can recognize this particular view;
(iii) that this view is relevant to the conversation. (Fraser 1988: 217-218)

Escandell-Vidal claims that a nominal tautology (in Spanish) has an abstract meaning which can be paraphrased as follows:
In the sentence NP1 = NP1
i) NP1 NP1 is a qualitative intensification of NP1 (to be read as 'NP1 with its prototypical features'); and
ii) this is an unquestionable truth. (Escandell-Vidal 1990: 7)

In the present paper I will analyze the meanings of Japanese 'tautological' expressions, or more accurately, three nominal reduplicative constructions: X wa X, X ga X, and X mo X, where X is a noun phrase. I hope the analysis of Japanese data will supply some new perspective to the study of nominal 'tautologies' in general.

The three constructions analyzed here are fully productive, yet they are idiomatic in that their meanings are largely non-compositional. The particle wa is a so-called topic marker; ga is a subject-marker; and mo is usually treated as having the meaning 'also'. Thus, for example, both oya wa oya and oya ga oya literally mean 'parent is parent'; and oya mo oya literally means 'parent is also parent'. However, each construction as a whole conveys meanings that are more than its literal meaning. In other words, these constructions do have communicative significance and are not mere redundant expressions.

2. X wa X (de)

X wa X is an emphatic expression which indicates the absoluteness of the category in question. This basic function can be divided into two usages: (a) to reconfirm the ascribed category--i.e. to emphasize the immutability of the category/attribute and (b) to emphasize the discreteness or autonomy of the item. In both usages, the repetition of a noun phrase effects an emphatic function.

(1) <from a TV drama>

*Hanarete ite mo,*  
*oya wa oya da kara mendoo mi-nakutyaa.*  
be away even though parent parent so look after must  
'(lit.) Even though (he) is away, (my) parent is (my) parent, so (I) must look after (him).'</p>

(1a) *Hanarete ite mo,*  
*oya da kara . . . .*

'Even though (he) is away, (he) is (my) parent, so . . . .'

Sentence (1) illustrates the first usage--reconfirmation of the ascribed category. In (1), the speaker is saying something like the following: Even though the person may not fit the ideal model of a parent, he is, as you know, still my parent, and that this fact cannot be changed. Compare (1), a reconfirmation, with (1a), which is a simple assertion: In (1) the category in question is already given, while it is not the case in (1a).

(2) (A woman writes about how much she cried when her husband passed away.) <from Asahi Newspaper>

*Watasi-tati wa kessite naka no yoi fuufu de wa arimasen desita.*  
we TM by no means amicable couple Neg Pst  
*Sore demo, fuufu wa fuufu datta no da to tuukan-sase-rare-ta*

yet couple couple Pst Comp feel strongly-Cs-Pas-Pst
koto desu.
Comp
'We were by no means an amicable couple, yet (a married) couple was
(a married) couple, (I) was made to feel (that) very strongly.'

(3) Henna katati site-te mo tukue wa tukue yo. Monku iwanai de
strange shape have-even though desk desk complain without
'tukainasai.
use Imp
'Even though (it) has a strange shape, (a) desk is (a) desk. (So) use (it)
without complaining.'

Examples (2) and (3) also illustrate the first usage. In (1)-(3), each item in
question is not a prototypical, or ideal example of the category denoted by the noun
phrase. This is one of the typical situations in which X wa X is used: By this
expression, the speaker underscores that the identity of the item cannot be changed
despite the existence of some doubt about it.
Another situation in which X wa X is often used for reconfirmation is when
there is/could be an attempt to change the category of the item.

(4) (A man is talking to his ex-mistress, who, contrary to his desire, wants
to resume the relationship.) <from a TV drama>
Soo yuu kankee ga iya de, moo osimai itte itta n desyo. Osimai wa
such relation SM dislike now end said TQ end
osimai na n zya nai no.
end Neg
'(You) didn't like such a relationship, so (you) said (it)'s over, didn't
(you)?(The) end is (the) end, isn't (it)?'

(5) (A mother and her daughter are talking about the mother's love
affair.)<from a TV drama>
Daughter: Kawaii wa ne, okaasan. Moo honto ni kekkon sitara.
cute mother now really marry how about
'(You are) cute, Mother. Why don't (you) get married for real?'
Mother: Li no yo. Mamagoto wa mamagoto da kara, kawaii no yo.
all right playing house playing house so cute
'(It's) all right. Playing house is playing house, so (it's) cute.'

(6) (A driver caught by the police for speeding tries to be pardoned saying
he had reasons for speeding. The police officer then says:) <from a
TV drama>
Donna zizyoo ga atte mo kisoku wa kisoku desu kara.
what kind of reasons SM exist even if rule rule so
'No matter what the reasons were, a rule is a rule, so . . . .'

(7) <from a novel Fushin no Toki by Ariyoshi Sawako.>
Matiko ga donna ni ki ga tuku onna da to itte mo kanozyo
SM how much attentive woman say even though she
o tuma to suru kangaee wa mootoo mo ukab-anakatta.
OM wife make thought TM not at all come up-Neg Pst
Nanto itte mo baa no onna wa baa no onna da.
No matter what (one) says, bar Gen woman, bar Gen woman.
'No matter how attentive Michiko is, the thought of marrying her did not occur to (him) at all. No matter what (one) says, a bar hostess is a bar hostess.'

For example, in (4) there is an attempt by the addressee to change the status of the relationship between herself and the speaker. But the speaker insists on the immutability of the category by using the X wa X construction. The same kind of situation is seen in (5)-(7).

Still another situation in which X wa X is often used for reconfirmation is when some typical property of the item is mentioned, as shown in (8) and (9): X wa X here functions like a summary of the given description.

(8) (The speaker after having criticized the conditions of the house she looked at for a possible purchase concludes:) <attested in conversation>

Yappari  ya sui  uti  wa  ya sui  uti  ne.
as expected  cheap house  cheap house
'As expected, (a) cheap house is (a) cheap house.'

(9) (The speaker is talking about the instant coffee she had.)

Yappari  insutanto  wa  insutanto,  nani  ka  mono-tarinai.
as expected  instant  instant  somewhat dissatisfying
'As expected, instant (coffee) is instant (coffee). (It) is somewhat dissatisfying.'

The examples of X wa X given in (1)-(9) contain regular nouns. However, pronouns may also occur, as shown in (10). The expression Watasi wa watasi 'I am I' in (10) is used as a reconfirmation of the identity of the speaker.

(10) (A high-school girl is complaining about the boys who change their attitudes toward her depending on her weight.) <from Asahi Newspaper>

Gaiken  wa  doo  de  are,  watasi  wa  watasi  na  no  desu.
appearance  TM  how  I  I
'No matter how (I) look, I am I.'

All these examples demonstrate that X wa X is used to emphasize the permanency of the attribute.

In the second usage of X wa X, on the other hand, the speaker is not so concerned with the attribute itself. Rather, X wa X is used to emphasize the discreteness or autonomy of the referent.

(11) <from a TV drama>

Daughter-in-law: Konya  uti  de  ikaga  desu  ka,  okaasan  no
tonight  home  at  how  about  Q  mother  Gen
taiin-iwai.
return  from  the  hospital-celebration
'How about tonight at our house, celebrating your
return from the hospital?'

Mother-in-law: Sonna  ii  wa  yo.  Tui  kono  aida  tanzyoo-iwai
that  no  need  just  the  other  day  birthday-celebration
site moratta bakkari zya nai no.
do receive just  Neg
'That's not necessary. (You) just gave me a birthday	party the other day, didn't you?'
Daughter-in-law: *lie, are wa are, kondo wa kondo desu.*
no that that this time this time
'No, that is that, this time is this time.'

(12) <from Asahi Newspaper>
*Kimi wa kimi, ware wa ware nari, saredo nakayosi.*
you you I I yet good friends
'You are you, I am I; yet (we) are good friends.'

(13) (The author writes about the difference between upper class people and
ordinary people like herself) <from a story by Hayashi Mariko>
*Betu ni rettoo-kan o motu koto mo nai. "Ano hito-tati*
particularly inferior-feeling OM have no need those people
*wa ano hito-tati to yuu keturon ga de-reba, sore igo*
those people Comp conclusion SM come out-when that after
tuki ai wa zuuto raku ni natta.
getting along TM much easy became
'There is no need to particularly feel inferior. "Those people are those
people," when (this) conclusion was drawn, after that, (it) has become
much easier (for me) to get along with (them).'

For example, in (11) the speaker insists that the two occasions are distinct from
each other, and that they cannot be mixed. Similar examples are shown in (12) and
(13).

(14) (A career woman expresses her feelings about reaching 40 years old)
<from Croissant, a women's magazine>
*Liwake de naku, watasi wa watasi to ieru yoo ni natta.*
excuse not I I Comp say can become
'(I) have become to be able to say 'I am I' not as an excuse.'

The difference between the two usages of *X wa X* may not always be clear.
For example, in (14), *watasi wa watasi 'I am I' may be interpreted as a
reconfirmation of the identity as well as an emphasis of the autonomy of the
referent. Similarly, examples (5) and (7) can be interpreted in both ways.2

(15) *Yasai wa yasai de koko ni oite kudasai.*
vegetable vegetable here put please
'Please put the vegetables here by themselves.'

(15a) *Yasai wa koko ni oite kudasai.*
vegetable here put please
'Please put the vegetables here.'
(16) (The speaker is talking about her wishes.) <attested in conversation>
Kore wa yume na no. Demo yume wa yume de toottok-anakuty na ne.
this dream but dream dream keep must
'This is (my) dream. But (I) must keep (my) dream separately.'

(17) (A nurse is talking to a patient about the patient's mistress.) <from
Fushin no Toki>
Kanzya-san no yooni okusan ni wa sir-ase-nai de uti wa uti de
patient Gen like wife TM know-Cs-Neg home home
daizi ni sitoku no ga hontoo desu nee.
carefully keep SM true/correct
'Like you--the patient, (one) should not let (his) wife know about (his)
affair, and carefully keep (his) home intact--that's the correct (way).'</n
The second usage of X wa X often appears in the form of X wa X de. In
(15), (16), and (17), for example, this form is used to emphasize the separation
of the item in question from other items. Compare (15) with (15a) in which no such
emphasis exists.

(18) <from a short story by Hayashi Mariko>
Sikasi, are wa are de tanosi-katta.
but that that fun Pst
'But that-wa that-de was fun. (That was fun for what it was.)'

(19) (A nurse is talking to a patient.) <from Fushin no Toki>
Otoko no ko wa nan tetatte sue ga tanosimi desu yo. Tanomosii
boy TM surely future SM look forward reliable
mono desu yo. Demo, musume wa musume de kawaii mono
but girl girl cute
desu nee. Ryooohoo aru no ga itiban desu yo.
both have SM best
'(In the case of) boys, (you) can surely look forward to (their) future
and rely (on them). But, girls-wa girls-de, (they) are also cute (the girls
are also cute for other reasons). To have both is the best.'

(20) <from a short story by Hayashi Mariko>
Watasu ga are hodo akogare, neratte iru itiruu-gaisya no
I SM that extent adore aiming first-class-company Gen
itiruu-otoko. Hiru-ma wa hiru-ma de syanai no onna-domo no
first-class-men daytime daytime office in Gen women Gen
monosugoi soodatu-sen ga ari, yoru wa yoru de hosutesu
formidable catch-fight SM exist evening evening bar hostesses
ga u no me taka no me.
SM on the close watch
'The first-class men in the first-class companies whom I adore so much
and whom I aim at. Daytime-wa daytime-de, there are formidable
fights among the office girls for catching (them); Evening-wa evening-
de bar hostesses are on the lookout (for them).'
Examples (18)-(20) illustrate another common use of \( X \, wa \, X \, de \). In these examples, the construction marks the autonomy of the item. In (18), for example, the writer underscores the fact that the event in question was fun independently of any other events. This \( X \, wa \, X \, de \) often functions as a contrastive framework for a predication: For example, in (19) \( musume \, wa \, musume \, de \) sets up a framework which is contrastive to the framework of boys mentioned in the preceding clause. A similar example is given in (20). As can be seen in (19) and (20), \( X \, wa \, X \, de \) is often used to mark two autonomous frameworks, which nevertheless result in the same kind of predications. Compare (20) with (20a); the latter simply lists two frameworks without indicating their autonomous nature.

3. \( X \, ga \, X \)

The \( X \, ga \, X \) construction is used to indicate that the referent in question has some negative or abnormal quality as \( X \).

(21) (A man and his wife are talking about their son's bad academic records.) <from a TV drama>

Wife: \( Anata \, seeseki \, doo \, datta. \)

you grade how Pst

'How were your grades?'

Husband: \( Un, \, maa \, maa. \, Kimi \, wa. \)

well so-so you TM

'Well, they were so-so. (How about) you?'

Wife: \( Maa \, maa. \, Oya \, ga \, oya \, da \, kara \, nee. \)

so-so parent parent so

'So-so. (The) parents are (not so good/smart) parents, so . . . .'

(21a) Wife: Maa maa. Demo, \( Oya \, wa \, oya \, da \, kara \, nee. \)

so-so but parent parent so

'So-so. But, parents are parents, so . . . .'

(22) (A man is talking about how badly he is treated by his wife because of his affairs.) <from Fushin no Toki >

\( Iya, \, watasi \, nado \, wa \, motto \, hidoi \, mono \, desu. \, Uti \, ni \, kaer-eba \)

no I like TM by far bad/terrible home retun-when

\( gesyuku-nin \, desu \, yo. \, Nanisiro \, zisseki \, ga \, zisseki \, de. \)

boarder anyhow records records and/or

'No, in my case, it's much worse. When (I) go home, (I)'m treated like a boarder. Anyhow, (my) records (of affairs) are (bad) records, so . . . .'
(23) (A and B are police officers; B is A's boss. B is talking about a murder case.) <from a TV drama>
A: Nani ka.
   what Q
   'What (did you want to say),'
B: Un, ree no ken, sono-go doo natta ka to omotte. Nanisiro
   yes that case that after how became Q wonder at any rate
   ziken ga ziken dake ni, syakai no kansin mo atumete iru koto da si.
   case case because society Gen attention draw Comp
   'Yes, (I) was wondering what has become of that case since then. At
   any rate, because (the) case is (an unusually bad) case, (it) is drawing
   (the) attention of the public, so . . . .'

For example, in (21) a couple is discussing the son's bad academic records. They then talk about their own grades, which were not so good. Then, the wife says Oya ga oya da kara nee, which means that the parents are not so desirable or smart. This could imply that it is understandable that the son is not smart, either. If, instead, the wife said Oya wa oya da kara nee, as shown in (21a), it would mean that the problem of the parents should be considered separately from the son's problem, which could imply that it is not impossible for the son to do well. Similar examples are in (22) and (23).

(24) A: Nee, kyoo pikunikku iku?
    Hey today picnic go
    'Hey, shall (we) go on a picnic, today?'
B: Soo nee, Otenki ga otenki da kara pikunikku wa yameyoo yo.
    well weather weather so picnic TM cancel let's
    'Well, (the) weather is (not good) weather, so let's cancel the
    picnic.'

(24a) *Otenki ga otenki da kara, pikunikku ni ikoo yo.
    weather weather so picnic go let's
    'The weather is (not good) weather, so let's go out on a picnic.'

(24b) Otenki ga otenki da kedo, pikunikku ni ikoo yo.
    weather weather but picnic go let's
    'The weather is (not good) weather, but let's go on a picnic.'

(24c) *Otenki wa otenki da kara, pikunikku wa yameyoo.
    weather weather so picnic TM cancel let's
    'lit.) Weather is weather, so let's cancel the picnic.'

(24) is another example. The expression Otenki ga otenki means that the weather is not good. Thus, it can be followed by an expression which suggests a cancellation of the picnic. Example (24a), on the other hand, is contradictory, as shown in the English translation. (24b) is appropriate because the conjunction kedo 'but' rather than kara 'so/therefore' is used. (24c), in which X wa X is used, does not make sense. Example (25) is similar to (24).
(25) (The speaker is talking about a place which is considered dangerous.)

\[
\text{Basyo ga basyo da kara, } \text{ki o tukenasai.}
\]

place place so be careful

'(The) place is (not a good/safe) place, so be careful.'

In examples (21)-(25), \textit{X ga X} is used to suggest some negative quality of the referent. However, this is not always the case. \textit{X ga X} may suggest some exceptional or unusual quality as \textit{X}, which can be considered very, or perhaps too good.

(26) (The speaker is talking about the very formal wedding to which she is invited)

\[
\text{Basyo ga basyo da kara, tyan to site ik-anakutyya.}
\]

place place so proper do go must

'(The) place is (not an ordinary) place, so (I) must go in (a) proper (dress).' 

(27) \textit{Jegara ga jegara da kara, hanayome-kooho mo sugoi wa yo.}

family family so bride candidates also extraordinary

'(His) family is (not an ordinary) family, so (the) candidates for (his) brides are also extraordinary.'

For example, in the context of (26), \textit{basyo ga basyo} indicates that the place of the wedding is not an ordinary place, but rather a very formal good place. A similar example is in (27). The reference to the 'good' quality of the item in these examples is not a straightforward praise, but seems to suggest some distance or uncomfortableness on the part of the speaker.

4. \textit{X mo X}

The construction \textit{X mo X} has two usages. One of them is similar to \textit{X ga X}. That is, it indicates that the item in question has some undesirable or abnormal quality as \textit{X}. The difference between \textit{X mo X} and \textit{X ga X} is that the former, but not the latter presupposes the existence of another item which is equally undesirable or abnormal.

(28) \textit{Oya ga oya da kara kodomo mo kodomo da.}

parent parent so child child

'(The) parents are (bad) parents, so (the) child is also (a bad) child.'

(29) \textit{Anata mo anata yo.}

you you

'(lit.) You are also you.' (You, too, are bad/undesirable.)

For example, in (28), the expression \textit{kodomo mo kodomo} indicates that the child is not good like the parents. Example (29) is often used to criticize the addressee. It presupposes that besides the addressee, there is someone else to be criticized.

The second usage of \textit{X mo X} is for intensification of the quality of \textit{X}. For example, in (30) \textit{X mo X} is used to indicate that the person in question is extremely beautiful. (31) is a similar example.
A: Kanojo bizin na n datte ne.
    she beauty I hear/they say
'She is a beauty, I hear.'

B: Un, bizin mo bizin, at-tara bikkuri-suru yo.
    yes beauty beauty meet-if be surprised
'Yes, (she) is a real beauty, if (you) meet (her), (you) will be surprised.'

A: Sono ko mada kodomo na n desyo.
    that child still child isn't (he)
'That child is still a (small) child, isn't (he) ?'

B: Un, kodomo mo kodomo, mada yooti-en mo ite nai n da.
    yes child child yet kindergarten even go Neg
'Yes, (he) is a real (small) child, (he) doesn't even go to kindergarten, yet.'

5. Conclusion

The foregoing analysis of the basic meanings of the three nominal reduplicative constructions in Japanese suggests that these basic meanings are mostly conventional: their meanings are non-compositional, that is, each morphosyntactic pattern formed by a repetition of a noun phrase and a particular particle as a whole\(^3\) carries certain meanings, and these meanings cannot be regarded as entirely dependent on the discourse context. It is, however, to be noted that although the meanings of each construction are non-compositional, they are not totally arbitrary, but rather related to the general function of each particle: i.e. \(wa\) as a marker for categorical judgment, \(ga\) as a marker for thietic judgment,\(^4\) and \(mo\) as bearing the meaning 'also'.

In addition to these basic meanings, each construction may convey pragmatic or attitudinal meanings, such as obligation, resignation, tolerance, defiance, and criticism.

(32) Hanarete ite mo, oya wa oya da kara . . .
    be away even though parent parent so
'(lit.) Even though (s/he) is away, (my) parent is (my) parent, so . . . .'

(33) Henna katati site-te mo tukue wa tukue yo.
    strange shape have-even though desk desk
'Even though (it) has a strange shape, (a) desk is (a) desk.'

(34) A: Nee, kyoo pikunikku iku?
    Hey today picnic go
'Hey, Shall (we) go on a picnic, today?'

B: Soo nee, Otenki ga otenki da kara.
    well weather weather so
'Well, (the) weather is (not good) weather, so . . . .'

For example, (32) may imply certain social obligation as a child; (33) may suggest defiance; and (34) may imply unwillingness. I contend that these additional
meanings are not part of the basic meanings of these constructions. Rather, they are inferable based on the basic meanings of each construction and the discourse context including socio-cultural expectations. This is because these meanings can be explicitly stated separately, as shown in examples (1), (3), and (24), and also because they vary considerably depending on the context. For example, the expression *oya wa oya* could imply obligation, resignation, criticism, appreciation, or many other attitudes. (See also Fraser (1988), Gibbs and McCarrell (1990), Ward and Hirschberg (1991), which discuss this point with regard to the interpretation of English nominal tautologies.)

This discussion leads to the conclusion that neither Gricean "radical pragmatics" nor Wierzbicka's "radical semantics" provides an adequate account of the meanings of the three nominal reduplicative constructions in Japanese. Rather, these constructions are best described in terms of both conventionality and pragmatic calculability. (With regard to the *X wa X* construction, some may still argue that its basic meanings can be inferred pragmatically: *X wa X* gives a redundant identification, which must imply that the speaker is emphasizing the immutability or discreteness of the category. I am not certain if this emphatic function is inferable pragmatically. Furthermore, this emphatic function seems always associated with the *X wa X* construction, hence can be regarded as the basic meaning (i.e. semantic invariant) of *X wa X*.)

Lastly, note that the construction *X wa X* seems to correspond to English 'tautologies' such as *Women are women* and *A promise is a promise*, although a closer examination is required to decide whether the usages of the Japanese and English constructions are identical. As described in the beginning of this paper, previous studies on nominal tautologies are mostly concerned with implicatures, attitudinal meanings, and properties of the noun in question. (This applies not only to the two "radical" approaches, but also to the definitions of nominal tautologies given by Fraser and Escandell-Vidal cited in section 1.) Little attention has been paid to the function of repetition as creating an emphatic effect. However, my analysis of *X wa X* as a device for emphasizing the immutability of the category or the discreteness of the item seems relevant also to such expressions as *Women are women* in English and other languages. In sum, my study calls for a reexamination of the basic function of nominal tautologies in general.

Footnotes

1 I would like to thanks Yo Matsumoto, Yoshiko Matsumoto, and Graham Thurgood for their valuable comments.
2 It is not clear to me how distinct the two usages are, but the second usage seems to become relevant when there is a clear contrast of categories.
3 It may be argued that *X ga X*, for example, is analyzable in that the second *X* has a negative meaning. However, such an account is inappropriate because the negative meaning cannot be effected without the first *X* followed by *ga*.
4 See Kuroda (1972) for discussion of the thetic and the categorical judgment.
5 A similar pragmatic approach is taken in Ward and Hirschberg (1991), although their study does not refer to the emphatic function of repetition. Based on their analysis of English data, Ward and Hirschberg claim that tautological utterances of the form 'a is a' (e.g. *Terrorism is terrorism*) are used to convey the implicature
that alternative utterances of the form 'a is b' (e.g. Terrorism is sometimes justifiable) are not relevant. I maintain, however, that what is rejected through a tautological utterance of the form 'a is a' is not the relevancy of alternative forms/propositions, but rather the possibility of assigning an alternative category to the item in question.

6 Fraser's description of nominal tautologues (cited in section 1) also concerns attitudinal meanings, although his use of the term "view" is very vague. Furthermore, his definition is so broad that it can be applied not only to nominal tautologues, but also to many other expressions. (See also Ward and Hirschberg 1991) Escandell-Vidal's definition (cited in section 1), I think, is inadequate in that the reduplication in expressions like War is war does not intensify the quality of the NP, and that prototypes are not always relevant in the use of nominal tautologies, as shown in the many examples in this study (e.g. (1), (4)).

7 Although I do not share Escandell-Vidal's view (footnote 6), her work is the only one that discusses the function of repetition directly.

8 Wierzbicka (1987: 109) points out that nominal tautologies may have a semantic invariant of the same own, which she paraphrases as follows: "An X is not different from other X's (all X's are the same). This cannot change." However, as noted by Wierzbicka herself, there are many uses of nominal tautologies to which this definition cannot be applied (e.g. East is East; you are you).

References


Wierzbicka, Anna. 1987. Boys will be boys: 'Radical semantics' vs. 'radical pragmatics'. Language 63-1, pp. 95-114.


Regular and Irregular Morphology
and the Psychological Status of Rules of Grammar

Steven Pinker
Department of Brain and Cognitive Sciences
Massachusetts Institute of Technology

Alan Prince
Program in Linguistics and Cognitive Science
Brandeis University

Supported by NIH Grant HD18381 and NSF Grant BNS 91-09766. We thank our collaborators Chris Collins, Marie Coppola, Greg Hickok, Michelle Hollander, John J. Kim, Gary Marcus, Sandeep Prasada, T. John Rosen, Annie Senghas, Michael Ullman, and Fei Xu.

Lucretius could not credit centaurs;
Such bicycle he deemed asynchronous.
—William Empson, "Invitation to Juno"

For many years grammatical theory has often been seen as a branch of cognitive psychology, aiming to characterize the mental representations underlying knowledge of language. Nonetheless the psychological status of rules and principles of grammar remains unclear. Does a rule of grammar literally correspond to a data structure or computational procedure implemented in neural hardware? Or is it a mere human-readable compressed summary of linguistic judgment data, an epiphenomenon of neurocomputational processes of a very different character? Many other questions in cognitive science would feel the impact of an answer to this one, ranging from innateness to cognitive architecture to the causes of language development in childhood.

In this paper we report the early stages of a project that focuses on one well-defined phenomenon of grammar and treats it as a "model organism." We are hoping that intensive multidisciplinary study of all relevant aspects of the phenomenon will lead to a depth of understanding that would not be otherwise possible, and might help towards the resolution of longstanding theoretical oppositions by pinpointing which aspect of language competing theories might be right or wrong about. Specifically, we are studying the psychology of inflectional morphology, beginning with an intensive investigation of English past tense and plural marking.

Inflection nicely encapsulates the central theoretical issues concerning the psychological status of grammar, because it involves two subprocesses that are closely matched in function but very different in operation. Regular inflection (e.g., walk-walked) is perfectly rule-governed, and thus looks like a paradigm case of a grammatical rule implemented in human brains. Irregular inflection (e.g., sing-sang) shows varying degrees of unpredictability and thus would seem to involve brute-force memory: the English-speaking child hears his parents say (e.g.) sang, and at some point memorizes it. Because the regular process seems to be the very essence of the symbol-manipulating, algorithmic approach to language underlying most theories of grammar, whereas the irregular process seems to involve a quite
different kind of memory-driven processing, the issue of regularity/productivity serves to bring opposing approaches to language into sharp focus.

**Principal Issues and Existing Theories**

Traditional grammars and introductory textbooks, recognizing the difference in predictability between regular and irregular subsystems, hint that inflection involves two psychological mechanisms: rules for regulars, rote for irregulars. Though intuitively appealing, the theory is well-known to be inadequate, for three reasons.

*Similarity between the morphological base and the (irregular) marked form.* Rote memory, as a list of slots, is designed for pairs with unrelated members, like *bevis.* But for subregular pairs in general, cross-linguistically, most of the phonological content of the stem is preserved in the inflected form. English *swing-* *swung* is a typical example (see Pinker & Prince, 1988, for extended discussion).

*Similarity within the set of base forms undergoing a subregular process.* An irregular alternation applies, often, to a family of phonetically similar items, even though the similarity is not enough to give necessary and/or sufficient conditions for the alternation. Thus, in English, we find irregular verb classes such as *sing, ring, spring, drink, shrink, sink, stink, begin, swim; keep, creep, deal, feel, kneel, mean, dream; grow, blow, throw, know, draw, fly; hit, put, cut,* and so on. Again, a rote list cannot explain why this huge degree of redundancy is maintained (Bybee, 1988; Pinker & Prince, 1988).

*Semiproductivity.* Irregular pairs are not a completely unproductive fixed list, but their patterns can to some degree be extended to new forms, on the basis of similarity to existing forms. All children occasionally make errors such as *bring-brang* and *bite-bote* (see Bybee & Slobin, 1982; Pinker & Prince, 1988). Irregulars can be added to the language diachronically by analogy with existing forms (i.e., *caught, cost, flung, knelt, quit, slung, stuck, strung*; Jespersen, 1942), a process that is especially obvious when many dialects are compared (e.g., *bring-brung, drag-drug, climb-clumb, heat-het,* see Mencken, 1936). Adult speakers of the standard dialect frequently extend irregular patterns to nonce stems in experimental tests (e.g., *spling-splung;* Bybee & Moder, 1983; Kim, Pinker, Prince, & Prasada, 1991; Prasada and Pinker, 1991).

The deficits of the traditional rote-&-rule theory have been handled in two very different ways. Generative phonology (e.g., Chomsky and Halle, 1968; Halle and Mohanan, 1985) implicitly accepts the view of memory as providing a set of (unrelated) slots. All regularities, of whatever generality, are to be abstracted out, and presented in the form of rules. In the classical version, this results in a lexicon that is the repository of pure unpredictability, reduced to an absolute minimum of specification; this is thought to subserve the psychological function of reducing the burden on memory (Bromberger & Halle, 1989). In more recent versions (e.g., forms of "Lexical Phonology"), the output of each lexical level is held to be listed, resulting in several entries for each item; presumably, the listing of information which is rule-generated is assumed not to place a burden on memory. In all versions of the theory, both regular and irregular processes are analyzed as manifestations of formally-similar rules, some of which are therefore limited in their scope by stipulations of various kinds.

This theory gives a straightforward account of input-output similarity: if an irregular rule is stated to replace a specified segment, the rest of the stem comes through in the output untouched, by default, just as in the fully regular case.
However, no real account is forthcoming for similarity within the input set and the associated semiproducivity of the alternation pattern. If a rule is simply attached to a list of the words it applies to, the similarity among stems within the list is unaccounted for. But if a rule is attached to a pattern shared by the words, by means of a context term for the rule or by means of a redundancy rule, it fails because the the similarity to be accounted for is typically one of family resemblance, rather than necessary and/or sufficient conditions: if an "i —> a" rule were to be linked to a pattern like CC_ng so as to embrace string, fling, cling, and so on, it will incorrectly include bring-brought and spring-sprang and fail to include stick-stuck and spin-spun (Bybee and Slobin, 1982; Pinker & Prince, 1988).

Connectionist models also collapse the regular-irregular distinction, but do so from the opposite end of the productivity scale, as it were, working from the general view that all processes, from the most idiosyncratic to the most regular, are functions of memory — using a much enriched (and perhaps more psychologically plausible) conception of what memory is. Under this conception, memory is associative and superpositional: individual items are dissolved into sets of features, and similar items literally overlap in their physical representations, sharing representational real estate. Learning consists of establishing excitatory or inhibitory connections between the atomic features of the representations, and may also depend on internal "hidden" features that a connectionist device can essentially define for itself. Many architectures now exist for structuring connectionist or "neural" networks, and they are demonstrably capable of performing a variety of nontrivial tasks.

The most complete attempt at modeling a real linguistic system, however, remains that of Rumelhart and McClelland (1986), which aims to simulate the acquisition of the English past tense. In it, a simple associative memory, implemented as a neural network, learns to associate uninflated inputs with the corresponding past tense outputs. A stem is decomposed into phonological features, each corresponding to a neuron-like unit in the input layer of nodes. Likewise, there is a layer of units representing the output inflected form; every input unit is directly connected to every output unit by a weighted link. Stem/past pairs are supplied to the network by a "teacher" and the model stores correlations among pairs of features in the stem and past by changing the weight of the links between their units. Link weights from different words are superimposed, and the output for a given word is computed by summing the weighted inputs and comparing the sum to a threshold. In this way the model generalizes to new verbs according to its similarity to old ones in the training set and according to the strength of the association between the stem features and various output features. There is no explicit representation of words or high-level rules, and a single network handles the regulars & irregulars: -oss in the input is linked to -ossed in the output in the same way that -ing in the input is linked to -ang in the output.

The achievement of the Rumelhart-McClelland model is that, after extensive training on several hundred verbs and their past tense forms, it successfully reproduces all the regulars and irregulars in the training set, and — more important — productively extends both regular and irregular alternations to many new test words, in accord with patterns of family resemblance.

The Rumelhart & McClelland model turns out to be more a general indication of what can be done with connectionist networks than a detailed scientific model of linguistic knowledge, performance, or acquisition. Pinker & Prince (1988), Lachter & Bever (1988), and Sproat (1992) point out a variety of severe
deficiencies in its treatment of linguistic structure. Stem/past similarity is totally unaccounted for, since the associative device can learn arbitrary input/output mappings (including linguistically impossible ones like string reversal), so long as they are relatively uniform across inputs. Lacking a representation of lexical items separate from their phonological content, the model cannot represent homophones with different past tense forms such as ring-rang and wring-wrung. By treating regulars and irregulars in a single associative mechanism, the model does not account for the fact that regular past tense formation, unlike irregular past tense formation, appears to be insensitive to frequency and similarity but can apply to any kind of form at all; low frequency and unusual-sounding regular verbs (e.g., rhumba'd and anastomosed) are readily inflected by English speakers, but not the Rumelhart & McClelland model (Prasada and Pinker, 1991). Universal inflectional properties of headed vs. headless (exocentric) structures are quite beyond the grasp of the model, since it intrinsically lacks notions like "head," "lexical item," and "morphological derivative." Nevertheless, the success of the model in picking up on patterns of stem-stem similarity and in using these productively — the very area where generative grammatical theory is largely silent — is striking, and suggests that the model, despite its manifest linguistic shortcomings, embodies a real insight into the organization of memory.

A New Approach

The conclusion we draw is that generative theories are fundamentally correct in their characterization of productive rules and structures, but deficient in the way they characterize memory of less predictable material, which must be associative and dynamic, somewhat as connectionism portrays it. It is necessary, then, to develop a new theory — an extension of the traditional rule & rote approach — which explicitly acknowledges the roles of rules on the one hand and of associative memory on the other. From such a theory, it follows that regular and irregular inflection must be computed by two different systems. Regulars are computed by an implementation of a classic symbolic rule of grammar, which concatenates an affix with a variable that stands for the stem. Irregulars are memorized pairs of words, but the linkages between the pair members are stored in an associative memory structure with certain connectionist-like properties (cf. Bybee, 1988). Thus while string and strung are represented as separate, linked words, the mental representation of the pair overlaps in part with similar forms like shrink and bring, so that the learning of shrunk is rendered easier given a constant number of learning trials, and analogies like brung occur with nonzero probability as the result of noise or decay in the parts of the representation that code the identity of the lexical entry.

The theory is close in spirit to theories in the generative literature that distinguish true productive rules of morphology from morpholexical "redundancy rules," which capture varying degrees of systematicity in lexical memory without freely licensing productive extensions to new forms (e.g., Jackendoff, 1975; Aronoff, 1976; Lieber, 1980). However, it aims to sharpen our psychological understanding of the phenomena attributed to the redundancy rules, which, qua rules, have always been somewhat mysterious in function. If our approach is correct, the reason they don't act like bona fide rules is that they are not rules at all, but epiphenomena of the way structured lexical entries are partially superimposed in memory.

The new theory, even in its preliminary form, allows us to integrate a large number of phenomena. Since it categorically distinguishes regular from irregular,
the theory predicts that the two types should dissociate from virtually every point of view. First, with respect to the psychology of language use, we predict that irregulars (as memorized items) must be affected by properties of associative memory, such as frequency and similarity, whereas regulars need not be. Second, with respect to language structure, we predict that irregulars (as listed items) should be available for other word-formation processes, whereas regulars — being nonlexical and freely created — should not be. Third, with respect to neural representation in actual brains, we predict that since regular and irregular are subserved by different mechanisms, it should be possible to find one system impaired while the other is untouched. The predictions can be tested using methods ranging from reaction time experiments to structural analysis of languages to study of child language acquisition to investigation of brain-damage and genetic language-deficits. We have been finding that existing evidence from all these sources seems to be converging on the predicted dissociations. Equally importantly from the point of linguistic research, the approach could lead to improvements in the separate theories of rule-action and of linguistic association. Only when the associationist complexities are removed from the rule system does it become possible to formulate clear principles of rule-form. Only when the truly rule-governed is abstracted from memory does it become possible to see the kind of architecture that associative memory for lexical structure should be endowed with.

In the rest of the paper we summarize evidence for this new theory, together with the major open questions. Though a coherent picture is beginning to emerge (see, Pinker, 1991), the work is very much in progress, and the global view will surely change as more of the details are uncovered.

**Effects of the Laws of Association:**
**Evidence for a Regular-Irregular Dissociation**

*Frequency effects.* The new theory predicts that irregular forms are stored, and all generalizations of irregular patterns are directly read off the stored forms (possibly governed by a prototype, implicit in the pattern of superimposition in memory). In contrast, a rule is available to generate regularly inflected forms online, and prior exposure to and storage of the inflected form is not necessary and affords no crucial advantage. Since memory traces get stronger with additional exposures, the theory predicts that irregular past tense formation should be highly sensitive to frequency, but regular past tense formation in general should not be.

There is abundant evidence for the first prediction, that irregular morphology is highly frequency-sensitive. Lower-frequency irregulars are more likely to be overregularized by children in errors like *breaked* (both in spontaneous speech, and in elicitation experiments; see Marcus, Pinker, Ullman, Hollander, Rosen, and Xu, in press; Bybee and Slobin, 1982), to be uttered incorrectly by adults when under time pressure (Bybee and Slobin, 1982), to drop out of the language diachronically (Bybee, 1985), to coexist with regular versions in "doubles" in the standard adult dialect (e.g., *dived*/*dove*) (Stemberger, 1989, Ullman & Pinker, 1990), and within doubles, to be the less preferred member (Ullman & Pinker, 1990). Presumably as a result of these psychological effects, the irregular vocabulary of English consists predominantly of high-frequency words; indeed, the 13 most frequent English verbs are irregular (Francis and Kucera, 1982). Even within the set of unique irregulars in modern English, frequency exerts a clear effect on linguistic judgments. The effect can be seen clearly in idioms and cliches, because they can contain a verb that is not unfamiliar itself but
that appears in the idiom exclusively in the present or infinitive form. Irregular verbs in such idioms can sound strange when put in the past tense: Compare You'll excuse me if I forgo the pleasure of reading your paper before it's published with Last night I forwent the pleasure of reading student papers, or I don't know how she bears the guy with I don't know how she bore the guy.

In a number of ways, regular inflection is free from such effects. Beginning with linguistic data, we find that regular verbs in nonpast idioms do not sound worse when put in the past: compare She doesn't suffer fools gladly with None of them ever suffered fools gladly. Similarly, some non-idiomatic regular verbs like afford and cope have common stems but very low-frequency past tense forms (Francis & Kucera, 1982), presumably because usually appear with can't and other negatives or modals, which require the stem form. But the uncommon I don't know how he afforded it (cope) does not sound worse than He can't afford it (cope).

The contrast can also be demonstrated quantitatively. Ullman and Pinker (1991) had 32 subjects rate the naturalness of the past and stem forms of several hundred verbs, both irregular and regular, each presented in a sentence in counterbalanced random order. For regular verbs (more specifically, regular verbs that did not rhyme with any irregular and hence are uniformly untainted by attraction to clusters of irregular verbs), ratings of their past tense forms correlate significantly (.62) with ratings of their corresponding stems, presumably reflecting the fact that the pasts are rule-analyzed for the occasion and hence simply inherit the naturalness of the stem, and the past tense ratings did not correlate significantly with the frequency of the past form (.14, after statistically removing linear effects of the stem itself in a partial correlation procedure), presumably because prior encounters did not leave permanent memory traces that would have made the frequent past tense forms more natural. In contrast, ratings of irregular past tense forms correlate less strongly with their stem ratings (.32) but significantly with past frequency (.35, partialing out stem rating).

The contrast is also visible in patterns of production of inflected forms in real time. Stemberger & MacWhinney (1988) report somewhat contradictory evidence, some of which they interpreted as showing that higher frequency regulars were less error-prone in elicited production than lower frequency regulars. Unfortunately they compared total frequency, not past tense frequency; this confound makes it difficult to know whether the effects they did find were due to global difficulty in reading or uttering lower frequency verbs, or to past tense frequency per se. Prasada, Pinker, & Snyder (1990) selected pairs of verbs that had identical nonpast frequencies (i.e., each pair consisted of a regular verb and an irregular verb that were equated on the sum of the frequency of the stem form, the frequency of the -ing form, and the frequency of the -s form), but that differed in their past tense frequency. The stem was flashed on a screen, and subjects had to utter the past tense form; a voice-triggered switch measured response time. In three separate experiments lower past-frequency irregulars took significantly longer to utter than higher past-frequency irregulars, but there was no such difference for regular verbs. Control experiments had subjects produce 3rd-person-singular forms (regular for all the verbs used), and simply read aloud all the stems and inflected forms; data from these control conditions showed that the effect of frequency on the production of irregular past forms is not an artifact of the selection of easier stems in the irregular low-frequency group. The interaction between regularity and frequency is not a floor effect of frequency, since the regulars were on average lower in frequency than the irregulars and spanned a larger frequency difference (the
opposite of what a frequency floor effect would require), and since frequency effects are generally logarithmic, so bigger differences would be expected for the regulars.

Finally, in recognition, Stanners et al. (1979) obtained evidence that only the stem form of regular verbs is stored as a distinct lexical entry, and that the inflected forms were analyzed on line into stem plus affix, whereas both stem and past forms of irregulars were stored. They used the repetition priming effect with a word-nonword discrimination task: when subjects must decide whether a letter string is a word, they respond more quickly if they saw that word in the preceding trials. Earlier presentation of a regularly inflected form produced the same amount of priming as prior presentation of the stem itself, suggesting that the inflected form activated a mental lexicon entry for the stem, not a lexical entry for the inflected form. In contrast, irregular stems were primed to a much lesser extent by an earlier presentation of their inflected forms than by an earlier presentation of the stem. Stanners et al. also found that the number of letters shared by items in a pair did not predict the amount of priming found for irregularly inflected or derivationally related items, suggesting that the greater priming for regulars is not an artifact of the greater amount of letterwise overlap. Similar effects have been found by Kempley and Morton (1982), using detection of auditory words in noise; though see also Fowler, et al. (1985); Sandeep Prasada has partially replicated this effect, using several improvements in methodology and materials.

**Effects of similarity.** Cross-linguistically, irregular items fall into clusters that participate in the same or similar morphological alternations and that display family resemblances among the invariant portion of the stem. Diachronically, of course, this is often connected with divergence through sound change from a truly lawful initial situation. But higher-level phenomena like paradigm leveling and attraction into irregular clusters require a cognitive, acquisition-based explanation. We explain the persistence of family resemblance clusters as the product of enhanced retention, and occasional extension by analogy, on the part of learners when faced with similar sets of forms.

Such analogizing was studied by Bybee and Moder (1983), whose subjects were more likely to extend an irregular pattern to a nonce stem the more similar it was to an existing English cluster: *spling* is inflected as *splung* (cf. *string, cling*) more often than *spiv* is inflected as *spuv*. Prasada and Pinker (1991) replicated the effect and did a similar manipulation with regular verbs, for which the new theory predicts that no significant generalization gradient should occur. They created 3 sets of nonce verbs that contained a vowel participating in an irregular alternation, and that differed in their similarity to existing regular English verbs: "prototypical" *plip* resembles *flip, slip, trip, clip, nip*, etc.; "peripheral" *ploamph* has an initial CCV and a final VCC that occur in no English verbs; *smaig* is of an intermediate degree of similarity. In three experiments using different modes of presentation and kinds or ratings, we confirmed that the rated naturalness of regular past tenses of peripheral stems were no worse than those of prototypical stems, controlling for naturalness differences among the stems themselves.

This interaction is clearly predicted by the rule/associative-memory theory, which posits that regulars are generally formed by free concatenation of an affix with a stem, producing a form that should inherit the naturalness of the stem without any modification contributed by the frequency of pairing of the affix with similar kinds of stems. It appears to contrast with the behavior of pure associative models such as that of Rumelhart & McClelland (1986), which did not generalize indiscriminately across regulars; for example, it failed to produce any output for
novel verbs such as *jump* and *pump*. Suspecting that dissimilarity from items in the training set was the cause, Prasada duplicated Rumelhart & McClelland's training conditions and tested their model's ability to generalize to our sample of nonce forms. As expected, the model generalized irregular patterns to verbs according to similarity, like our subjects and those of Bybee and Moder (1983); but, unlike our subjects, it also analogized regular inflection according to similarity, producing regularly inflected forms only for verbs similar to those trained. Sproat (1992) reports simulations with Dana Egedi demonstrating comparable generalization failures in a hidden-layer back-propagation extension of the RM model; this suggests that it is not the perceiver architecture of the original model, now considered old-fashioned by most connectionists, that is responsible for its shortcomings at generalizing regular morphology.

**Open Questions about Associative Effects**

Are regularly inflected forms *ever* stored in memory? Though the new theory predicts that productive regular inflection does not depend for its success on storage of previously encountered regular forms, it does not deny that some such forms can in fact be stored. Indeed it would be an ad hoc stipulation to rule it out: if human memory is capable of storing an arbitrary irregular form as the past tense counterpart of a given verb stem, there is nothing that could prevent such memory slots from being filled with regularly inflected forms as a special case. Rather, the prediction is only that generalization does not *depend* on prior storage, and thus that there is generally no need for the system to store them. A corollary of this position is that storage is needed whenever an attested regular form could not have been predicted by the speaker's rule system. There are several such circumstances.

First, children, before they have formulated the language-specific parts of a given rule, have no choice but to memorize regularly inflected forms if they are to use them at all. Marcus et al. (in press), in their analysis of data from Courtney Cazden (1968) on children's use of regular and irregular inflection in spontaneous speech transcripts, found that young children, before they show clear evidence of possession of the regular rule in the form of overregularizations like *breaked*, sporadically use correct regular past forms in past tense contexts (in most such contexts, they leave the verb unmarked). Reliable tensing of regular verbs in obligatory past tense contexts occurs later and is correlated over time with overregularizations, suggesting that a transition from pure reliance on memory to availability of a rule underlies both developments.

Second, many regular plurals have developed meanings that do not correspond to the composition of the stem meaning plus plurality (such as, perhaps, *drinks* as a collective term for alcoholic beverages, and pluralia tautum forms like *alms* and *pants*), and they must be stored.

Third, if a verb is a doublet with equally-strong synonymous regular and irregular alternants, such as *dived/dove* or *slit/slitted*, then the very existence of the regular is unpredictable, because ordinarily the presence of an irregular form blocks the regular rule (Aronoff, 1976; Kiparsky, 1983; Pinker, 1984). In such circumstances survival of both forms in a speaker's dialect can only be explained in terms of storage of both, and other data collected by Ullman and Pinker (1990), discussed below, support this prediction.

Finally, Ullman and Pinker (1991) discovered another, more surprising circumstance in which regulars are stored. For regular verbs that rhyme with at least one irregular (e.g., *blink*, which rhymes with *drink*, *stink*, and so on), past tense
frequency has a small but measurable positive effect on subjects’ ratings of the naturalness of the past tense form, even when the global naturalness of the stem is partialed out. It is as if forms like blinked are somewhat unpredictable because of the attraction by analogy to the cluster of similar irregulars, which by itself would tempt the speaker to expect blank or blank. The effect is tiny — even very rare regular verbs, such as steep, are rated much higher in their regular past tense form than the version analogous to a rhyming irregular pattern — and indeed we know from historical data that the effect must be tiny, given that reinforcement of an irregular past form by families of similar rhymes is not enough to prevent the verb from sliding into regularity as its frequency declines (Bybee, 1985). What we have found is only that speakers have some small tendency to remember those regular past forms that flout the weak attraction of irregular clusters.

The Nature of Associative Lexical Memory. The new theory, like associationist theories, proposes that irregular generalizations are based on memory-driven analogies, but it is not clear what this means in mechanistic terms. An associative network mapping between stem features and past features, a la Rumelhart and McClelland, is implausible because stem-past similarity is unexplained; such a model could easily learn unnatural mappings such as changing all a’s to b’s, all b’s to c’s, and so on (Pinker & Prince, 1988). Furthermore the actual behavior of their model showed that it blended outputs from bits and pieces of material associated with various stem properties, resulting in odd chimeras like mail-mumbled and tour-toureder — a distinctly nonlinguistic process.

An alternative that is far closer to generative models would associate stem features in the input with a small number of rules or morphemes (e.g., vowel-changes, restricted suffixes) in the output. This would account both for the precision of the irregular mappings between stem and past (most of the stem preserved, and a small number of mappings existing across the irregular stems; see Pinker & Prince, 1988), as well as the family-resemblance and generalization-by-similarity effects: a rule would be applied with nonzero probability to stems similar to the ones it should apply to. However, this model has other empirical failings. The psycholinguistic evidence suggests that irregular pasts are stored as lexical entries, not computed on line. Similarly, Bybee and Slobin (1982) point out that speech errors occurring when irregular pasts are elicited are virtually always existing but incorrect English words (e.g., *rise-raise*), never novel rule products (e.g., *rise-rewse*). This suggests that the system stores word-word associations, not word-rule associations. Finally, the linguistic structure of the irregular classes is consistent with this conjecture: all 180 irregular stems, and their corresponding past tense counterparts, are monosyllables, the minimal word-size of English (see McCarthy & Prince, 1986, 1990, to appear), and there is more uniformity among irregular past forms than among mappings between stems and their past forms. For example, -ought is a frequent irregular rhyme, but it is associated with a heterogeneous set of stems: buy, bring, catch, fight, seek, teach, and think.

It is not clear exactly what kind of associative memory fosters just the kinds of analogies that speakers are fond of. Possibly a network of word-word associations might give rise the right generalization structure if the design of the lexical representation is informed by modern linguistic theory and its implementation is informed by models of superpositional memory. Here we can only present a rough sketch.

Words might be represented in a hierarchical hardware representation that separates stems and affixes, and furthermore distinguishes foot- and syllable-internal structure, finally representing segmental and featural composition at the
lowest level of units. Furthermore each of the possible contents of each representation would be implemented once as a single hardware "type"; particular words would be represented in separate "token" units with pointers to the types it contains. Links between stems and pasts would be set up during learning between their representations at two levels: between the token representations of each pair member, and their type representations at the level of representation that is ordinarily accessed by morphology: syllables, onsets, rhymes, feet (specifically, the structures manipulated in reduplicative and templatic systems, as shown in the ongoing work of McCarthy & Prince and others.) Ordinary correct retrieval results from successful traversal of token-token links; this would exhaust the process for pairs like *go-went* but would be reinforced by type-type links for members of consistent and high-frequency families like *sing-sang*. On occasions where token-token links are noisy or inaccessible and retrieval fails, the type-type links would yield an output that has some probability of being correct, and some probability of being an analogical extension (e.g., *brang*). Because the representation of input and output are each highly structured, such extensions would nonetheless be precise and follow constrained patterns, e.g., preserving portions of the stem such as onsets while substituting the appropriate rhymes, and avoiding the chimeras and fuzzy approximations that we do not see among real irregulars but that pure feature-to-feature networks are prone to making.

A more distant goal would be to see if such an interaction between linguistic representation and superimpositional memory can be applied to the notoriously capricious productivity of much of English derivational morphology, especially Latinate affixation and allomorphy attributed to Level 1 in Lexical Phonology, and other "partially productive" morphological processes.

**Interactions among Lexical and Morphological Processes:**
**Evidence for a Regular-Irregular Distinction**

There is a large linguistic literature on interactions among processes of lexical storage, derivational morphology, and inflectional morphology (e.g., Aronoff, 1976; Kiparsky, 1983; Williams, 1981; Anderson, 1984; Lieber, 1980; Selkirk, 1982). Such phenomena provide particularly compelling interdisciplinary evidence for qualitative, universal, possibly unlearned structural organization of one part of the human language system and therefore can test one of the most contentious issues in language study. A crucial prediction, in simplified form, is as follows: irregulars are stored as lexical entries, and can be the input to lexical rules of morphology. In contrast, regulars are computed from lexical entries, so they operate on the output of other morphological rules. Two sets of morphological phenomena bear on the prediction.

**Exocentrism.** Pinker and Prince (1988) point out a fatal flaw in Rumelhart & McClelland's claim that past tense formation can be accomplished without representations of morphological structure, by mapping phonological features to phonological features. The flaw is that in real speakers, any irregular mapping is squelched in favor of the regular when the verb is sensed to be derived from a noun or adjective: *high-sticked*/*stuck*, *grandstanded*/*grandstood*; see Kiparsky, 1983). A simple principle explains this and related phenomena: irregularity is a property of stored roots, not words (which can be derived from roots by rules). A word can take an irregular form only if it is headed by an irregular root; otherwise, the regular rule applies, acting as the default. *High-stuck* is ruled out because its head is a
noun, not a verb, and noun roots cannot be listed in the lexicon as having any past tense, let alone an irregular form.

Moreover, only if the root is in "head" position (Williams, 1981; Selkirk, 1982) can its irregularity be inherited by the word as a whole. In English the head is the rightmost category at every level of word structure, and we posit that all features of a category — its pointer to a semantic referent, its grammatical category, its morphological features like animacy and gender, and its irregularity — are copied from the head at a lower level to the head at the next level up. If any such feature has not been copied, it diagnoses the word has not having a head, or being exocentric; the prediction is that if a word is exocentric by any criterion of non-inheritance of a root feature, it may not inherit the irregularity of the root either. This explains the regularization of the baseball term flied-out, which has a verb root fly but is immediately based upon the noun a fly ball. Its full structure is [[V][N][[[V]fly]]]; the intervening Noun category, since it cannot have been copied from the base verb, indicates exocentrism which also blocks the copying of the irregularity of that verb. Similarly low-lifes/*lives can be explained in terms of the word not denoting a kind of life and hence being ineligible for the endocentric structure that would allow the irregularity of life to be inherited by the whole verb (similar explanations apply to walkmans, the Mickey-Mouses in the administration, The Toronto Maple Leafs, and many others; Pinker and Prince, in preparation.)

Kim et al. (1991) showed that subjects — including people lacking the benefit of a college education — were sensitive to this constraint when rating regular and irregular past tense forms of novel verbs derived from nouns or from other verbs. For example, when presented with novel irregular-sounding verbs (for example, to line-drive), they strongly preferred the regular past tense form (line-driven) when it was exemplified in a context that made it clear that it was based on a noun ("to hit a line drive"). In contrast, in a control condition for unfamiliarity where the items were based on existing irregular verbs ("to drive along a line"), the usual irregular was preferred. Kim et al. also showed that the effect is not reducible to degree of semantic similarity, and that usages that appear to be counterexamples are explained by the availability of alternative analyses to speakers: when and only when a verb can be given a sensible endocentric analysis (e.g., sublet, which can be analyzed either as [vsub[vlet]] or as [v[Nsublet]]), competing regular and irregular forms are permissible. Kim, Marcus, Hollander, and Pinker (1991) have demonstrated that children's inflectional processing is sensitive to exocentrism as well. For example, preschool children prefer the form ringed to describe putting a ring on a finger, and rang to describe an act of striking a resonant object (including nonprototypical instances of ringing).

**Compounding.** Kiparsky (1983) pointed out that compounds generally can contain irregular plurals as their nonhead members, but not regular plurals: mice-infested/*rats-infested; teeth-marks/*claws-marks; purple-people-eater/*purple-persons-eater. This follows if compounds are formed only from stored words, not from complex rule products, and if irregulars but not regulars are stored words. Gordon (1986) showed that preschoolers are sensitive to this constraint when asked to form compounds like X-eater. The phenomenon involves high stakes, as Gordon showed that compounds containing any kind of plural are of near-zero frequency in English. Children's exclusive use of irregulars in the absence of input evidence exemplifying such a constraint, he argued, suggests that their morphological systems are innately organized so that irregular patterns are distinguished from regular ones and only the former can feed rules like
compounding; this is an example of Chomsky's "poverty of the stimulus" argument. Claussen, Rothweiler, Woest, and Marcus (1991) report similar results from German children.

Open Questions about Lexical-Morphological Interactions

One complication for the proposal that compounding distinguishes irregular from regular plural nonheads is the existence of classes apparent counterexamples to Kiparsky's generalization in English, such as *drinks cabinet, parks commissioner* and *grants administration*; Senghas, Kim, Collins, and Pinker (1991) have collected scores of examples from speech and writing. Selkirk (1982) suggests that some of the compounded plurals are noncompositional forms with unpredictable meanings, hence must be stored despite their purely morphological regularity (e.g., *drinks* for alcoholic beverages). Others, perhaps, are metonymic, as when *parks* refers to the department or portfolio of parks. Unfortunately, although our list contains many forms that submit to this explanation, it also contains forms whose regular plurals seem perfectly compositional, such as *publications catalogue, injuries report, enemies list, and chemical weapons attack*.

An alternative hypothesis is that Kiparsky's constraint is not purely morphological but semantic, which then interacts with morphology. Say that compounds may contain only singulars and, by extension, collective terms (those referring to an aggregation as a whole). Some regular plurals meet this definition for semantic reasons, but all irregulars meet it for morphological ones, because as forms stored by virtue of their unpredictable morphology they are paired directly with their referent of a set of objects, rather than composed out of the meaning of the single referent plus the operator of plurality. Crosslinguistically, the idea of "number" is often reflected in semantic notions like "collectivity" and "distributivity" rather than in a simple, syntactically-agreeing numerosity distinction (Mithun, 1988; Bybee, 1985). Therefore one might argue that irregular plurals in languages like English, since they lie formally outside the productive plural system, are liable to interpretation in terms of these universal derivational categories. Tiersma (1982) shows specifically that noun referents that have natural collective interpretations are correlated with morphological irregularity diachronically and crosslinguistically.

Senghas, et al. (1991) put this hypothesis to the test and obtained conclusive refutation of it. Sixteen adults judged the naturalness of novel compounds like *geese-feeder* and *ducks-feeder* differing in whether the initial noun was regular or irregular (matched for semantics and frequency), singular or plural, affected collectively or noncollectively, and in a root or synthetic compound. Compounds containing irregular plurals were rated as far more acceptable than those containing matched regular plurals. Moreover, the effect was independent of collectivity: compounds where the referents of the nonhead word were affected as a collection were better than compounds where the referents of the nonhead word were affected individually, but the magnitude of this effect was perfectly additive with the effect of the regular/irregular contrast. If the effect of irregularity were only to foster a collective reading, then when such a reading was forced by our context instructions, the effect would have disappeared or at least have been reduced. Thus there is a robust, unconfounded regular/irregular distinction in compounding, just as Gordon and Kiparsky assumed.

Senghas, et al., also determined that the irregularity advantage held in root compounds and synthetic compounds with equal force, dashing any hopes that one
kind of compound was fussy about regularity and the other, the source of the counterexamples, was not. Currently it appears that at least a relativized version of the Kiparsky effect, namely a preference for irregular forms inside compounds, is a genuine part of human psychology, but it does not act to rule out all regular plurals-inside-compounds. Conceivably there are multiple compounding processes in English, a stringent but natural-sounding process that only accepts stored lexical entries (including, as an automatic special case, irregular inflected forms, but not regular inflected forms), and a less natural and less choosy process that accepts as first member virtually anything (including phrases or parts thereof as in seat-of-the-pants executive and American history teacher under one reading; see Lieber, 1988, Halle and Mohanan, 1985) this "loop" would embrace regularly inflected words as a special case.

Another complication involves differences in the interaction between compounding and plural inflection in other languages. Gordon (1986), prompted by Melissa Bowerman, noted that in Dutch, most nouns take the -en plural ending (phonetically schwa), yet many compounds contain -en plurals. Dutch also has an -s plural suffix, which does not appear in compounds (with one or two restricted kinds of exceptions). Gordon proposed that the -en is not "regular" in the crucial sense, in that it is not entirely predictable and may occasion idiosyncratic phonology, whereas the -s is fully regular and is the default, productive suffix. However, our own informant study, carried out by Chris Collins using a carefully constructed ratings questionnaire (Senghas, et al.), shows this to be unlikely. Both -en and -s were productively used by a native speaker to pluralize names, nonce-forms, and syntactic collocations; the two affixes have separate domains of productivity, defined by phonological criteria and by vocabulary class (e.g., foreign vs. native), but within those domains they are both demonstrably productive.

The Dutch situation, and the similar one for German, poses an unsolved but tantalizing problem. One possibility, suggested for German by Clahsen, et al. (1991) is the -en suffix is applied productively in the same block of rules as compounding ("Level 2" in Lexical Phonology), allowing it to feed compounding; the -s suffix applied downstream in Level 3, as in English, too late to feed compounding. An alternative is that feeding relations among the lexicon, derivation, and inflection are not dictated by a small number of levels or strata, but, in the unmarked case only simple lexical roots (including irregulars) may feed processes like compounding and derivational affixation, and the child relaxes the restrictions on an rule-pair-by-rule-pair basis, in the form of morphological selection restrictions on particular rules, as multiply-derived forms are recorded from the input. Fabb's (1988) analysis of the extremely limited number of permissible feeding relations in English derivation gives initial plausibility to such a suggestion.

**Regular-Irregular Dissociations in Special Populations**

If regular and irregular patterns are computed by different kinds of neural systems, we should expect them to to dissociate in individual people impaired in specific ways: certain kinds of populations should evince the ability to produce irregulars but not regulars, or vice-versa.

*Children*. Marcus et al. (in press), confirming Ervin (1964) and Cazden (1968), showed that children younger than about 2 1/2 display one such dissociation: they produce correct irregular pasts and plurals before making overregularization errors. We showed that this famous "U-shaped" developmental curve is not a statistical artifact, and that it cannot be explained, as Rumelhart &
McClelland conjectured, as a response to an increasing mixture of regular verbs in the child's input. The proportion of regular verb tokens in children's and parents' speech remains unchanged throughout childhood, because high frequency irregular verbs (make, put, take, etc.) dominate conversation at any age. The proportion of regular verb types in children's vocabulary necessarily increases because irregular verbs are a small fraction of English vocabulary, but this growth does not correlate with overregularization errors. The traditional, and we argued, correct explanation for the developmental sequence is that memorization of irregular verb forms from parental speech can take place as soon as words of any kind can be learned, but deployment of the rule system must await the abstraction of the English rule from a set of pairs of words accumulated across different parental sentences and correctly juxtaposed as nonpast and past versions of the same lexical entry. The resulting time lag defines the "U"-shaped sequence. Evidence confirming that acquisition of the regular tense-marking process is the rate-limiting step in the appearance of the child's first errors is the fact that the onset and rate of overregularization correlate with the reliable use of regular past tense marking of regular verbs in obligatory past tense contexts.

Aphasics. Marin, Saffran, and Schwartz (1976) showed that two stroke victims with symptoms commonly characterized as "agrammatic aphasia" displayed frequent errors in reading inflected forms: smiled was pronounced as smile, wanted as wanting. They noted that "the difficulty ... is not found with irregular forms. Both irregular plural nouns and verbs with irregular past tense forms were read several orders of magnitude better than their regular counterparts." A more controlled comparison involved regular plural nouns such as misers, clues, buds and phonologically-matched counterparts that are not compositional plurals of singular terms, such as trousers, news, suds; the former were read at 90% accuracy; the latter at 45%. This is predicted if agrammatic symptoms are caused by damage to a neural system that involves circuitry for implementing the regular rule, which is necessary for analyzing the regularly inflected stimulus forms, but left the lexicon relatively undamaged, including stored irregulars, which could thus be successfully matched against the irregular stimuli. Greg Hickok has replicating the effect with a carefully-studied aphasic patient, using a list of regular and irregular verbs that were equated for stem frequency, past frequency, and pronounceability; control words with similar phonological content are also included.

Specific Language Impairment. Gopnik (1990a, 1990b, 1991) documents a syndrome of hereditary Specific Language Impairment whose most lasting grammatical symptom is difficulty in controlling inflectional features. The patients make frequent number, tense, agreement, person, and case errors in their speech, and in experiments, they have trouble converting present tense sentences to past tense sentences and in inflecting nonce verbs compared to their non-afflicted sibling controls. They performed far better with irregular verbs, occasionally producing them in speech, writing, and elicitation experiments, presumably because of their high frequencies. Interestingly as the dysphasics grew older they appeared to learn regular inflected forms one by one on a memorized basis: verbs with higher past tense than stem frequencies were learned first, and then additional regulars were learned one by one, with no transfer from one regular verb to another, in response to explicit teacher training. As adults the family members sound almost normal, though as mentioned, they had trouble inflecting nonce forms like the plural of zoom; this suggests an extensive process of memorizing regulars. In other words their ability to apply inflectional rules seems impaired relative to their ability to
memorize words: irregular forms are acquired relatively easily, enjoying their advantage of high frequencies, regulars are memorized as if they were irregular.

An interesting possible implication of the SLI and aphasic syndromes is that their deficits do not appear to extend to the pure morphotactic operation of concatenating stem and affix. The aphasics and SLI children do not eschew all regularly inflected forms; their errors consist of incorrect combinations (e.g., musics and Montreal Forums in one of Gopnik's subjects) or combinations that are incorrect in context. Clahsen (1990) reports similar phenomena in German SLI children. If this is a general phenomenon, it would suggest that systematic encoding of grammatical features in less-than-word-size morphemes can be dissociated from handling the phonological material expressing those morphemes, and that it is the encoding process that is the neurologically vulnerable computation.

**Williams Syndrome.** It would be desirable to demonstrate a double dissociation between regular and irregular morphology, which would require a patient group that made frequent overregularization errors with irregulars, while having full control of the regular rule. According to the theory, we predict such a pattern to occur in a population whose grammatical system was intact, but who had problems in retrieving lexical items, especially high-frequency lexical items, from memory. Children with Williams syndrome (a syndrome of retardation probably caused by a defective gene expressed in the CNS involving calcium metabolism), as documented by Bellugi, et al. (1990), display these prerequisites: they are often described as "hyperlinguistic" or as having "selective sparing of syntax," but they retrieve words in a bizarre fashion, failing to answer questions with the high-frequency words offered by most other children, retarded or normal. For example, when asked to name some animals, they respond not with dog, cat, pig but with unicorn, tyrandon, yak, ibex. It almost seems too good to be true that some of these children, according to Bellugi et al., produced "morphological errors" as one of their few mistakes in grammar, which Klima and Bellugi (personal communication) confirm consist largely of overregularizations (16% of irregular past tense forms), a surprisingly high rate for children of this age (late teens).

**Regular-Irregular Interactions and Blocking**

Any theory positing alternative mechanisms for computing a form must specify how they interact. Following Kiparsky (1983), Aronoff (1976), and others, we assume a Blocking principle: retrieval of an irregular (e.g., came) blocks application of the regular rule (which would otherwise have yielded comed). The theory raises three interesting issues.

**Regular-Irregular Doublets.** The existence of doublets such as dreamed/dream at first glance poses a dilemma, because a blocking mechanism should proscribe them. Blocking cannot simply be abandoned, because we need it to explain the ungrammaticality of comed and feeled. Nor can one posit that learners are conservative recorders of all and only the past tense forms they hear, for this would leave them unable to form past tenses for low-frequency and nonce forms like anastomose and wug. Pinker (1984) argued on learnability grounds that learners store the regular past tense version of verb if and only if they also hear an irregular competitor to it. As discussed, this proposal is a simple corollary more general principle that the unpredictable must be memorized: a regular form that coexists with an irregular version would have been unpredicted by the speaker, given the operation of Blocking, and must be memorized, just like all irregulars are. Indeed, Ullman and Pinker (1990) found that subjects ratings of the naturalness of
both the regular and irregular members of doublets correlate with the respective frequencies of the past tense forms in English. In contrast, recall that regular past tense forms that do not belong (and are not attracted) to doublets are rated independent of frequency. This shows that hearing the regular version of a doublet (but not regular forms in general) is important to its survival in speakers.

This in turn raises the question of how doublets arise in a dialect to begin with. An obvious explanation runs as follows. If irregulars are stored in a frequency-sensitive memory, then the lowest-frequency irregulars, stored in weak traces, may provide the speaker with a barely above-noise memory signal, leaving them in doubt as to whether to block the regular rule. (For many people this is palpable when they are faced with deciding between, e.g., striven and strived; they report not being sure whether they have heard striven.) This theory predicts that the goodness of the irregular member of a doublet should be negatively correlated with the rating of the regular member, and this is what Ullman and Pinker (1990) found ($r = -.76$).

Overregularization in children. Another apparent counterexample to the operation of blocking — if thought of as an inherent aspect of the human linguistic apparatus — is children's apparent nonchalance in regularizing irregulars, as in brooked. For irregular verbs that a child has never heard before, regularization is the only choice, but children regularize irregular verbs that they have previously used correctly for months. Indeed, children frequently alternate between irregular and regularized past tense forms of a given verb in a single conversation. For this reason overregularization has been a major puzzle in language acquisition research. If children are happy with free variation between regulars and irregulars, what makes them turn into adults, who block regularization when they know an irregular? (Research on parent-child interaction shows that it cannot be overt corrections or other forms of parental feedback, for parents do not reliably react to their children's grammatical errors; see Morgan and Travis, 1989; Marcus, 1991). But if children's linguistic systems are designed to block overregularization, why do they do it so often?

Marcus, et al. (in press) addressed these questions in a massive study of the 11,500 irregular past tense forms in the spontaneous speech of 84 children. Their major discovery comes as a shock to all those who think of children as exception-hating relentless regularizers: Overregularization errors are at all ages a small minority of irregular past tense forms (2.5%). This finding, combined with the fact that overregularization rates for different verbs correlate negatively with the verbs' past tense frequency in parental speech, exorcises most of the paradox. We proposed a simple explanation: children, like adults, mark tense using memory (for irregulars) and an affixation rule that can generate a regular past tense form for any verb. Retrieval of an irregular blocks the rule, but children's memory traces are not strong enough to guarantee perfect retrieval. When retrieval fails, nothing blocks the rule, and overregularization results. The cure for overregularization is living longer, thereby hearing irregular past tense forms more often and strengthening their memory traces. If so, the single phenomenon of incomplete or unreliable blocking by low-strength memory traces for irregular verbs provides a single explanation for overregularization errors, adults' admission of new doublets, and diachronic loss of an irregular (see Bybee, 1985).

Real-time psychological processes implementing Blocking. An interesting psychological issue is how blocking might be computed in real time during speech production. The simplest model is that the speaker scans the list of irregulars for the target stem, outputs an irregular if one is found, else applies the regular as the
default. This predicts that irregular pasts will be produced in less time than regulars — exactly opposite to the finding of Prasada, Pinker, and Snyder (1990). Assuming their finding of a speed advantage for regular past forms holds up in a planned replication where (unlike the original studies) regular verbs do not constitute a majority of the experimental items, it would suggest the following simple alternative model. A stem is matched against the memory in which irregulars are stored, and fed into the regular rule mechanism, in parallel. A one-way lateral inhibitory pathway connects the irregular memory system to the regular rule system. Assuming that memory matching involves a stochastic, feature-by-feature comparison, the process of matching a stem against the irregular array would yield a continuous signal indicating the probability of a complete match, becoming more accurate over time as more features of the input and memory forms are compared; this signal is what inhibits the regular rule. Since determining that a match merely exists requires less information that recovering the specific content of the stored irregular, the regular system can be turned off before it outputs an overregularization, allowing the irregular to be produced once its entire form is retrieved. When there is no irregular match, the rule process runs to completion uninhibited and quickly outputs the regular form. This predicts that people will take longer to produce regular verbs that resemble irregulars, since an early false match signal will temporarily inhibit the rule process. Seidenberg and Bruck (1990) report preliminary evidence for such a finding.

**Toward a Theory of Universal Morphology**

Ultimately an understanding of the psychology of morphology will require a theory of "universal morphology" that predicts possible and impossible human languages and that characterizes the child's language learning mechanism. The strongest prediction is that we should find the following association: certain inflectional patterns should be predictable in form, readily applied to nonce stems regardless of their global similarity to existing stems, exclusively applicable to exocentric words (derived from other grammatical categories, borrowed from other languages, or with referents distinct from that of their roots), and inadmissible inside lexical compounds and other derived words. These, we claim, involve the psychological mechanism "regular rule." A language could also contain inflectional patterns that relate pairs of items each meeting the phonological definition of "canonical word" in the language, whose forms cannot be predicted perfectly by the form of the stem, that occur either in high frequency items or within families of similar stems or both, that are extended to new forms only tentatively and in cases of high similarity to existing stems, that may appear inside compounds and other derived words, and that may not apply to exocentric words. These are "associatively-memorized irregular pairs."

It is an extremely strong prediction that in any language one should find that phenomena in either of these two clusters should be found exclusively in association with one another, never in association with a phenomenon from the other cluster. Notice that this is not a prediction of Lexical Phonology, which does not establish any principled relation between productivity and assignment to lexical level, though the state of affairs can be represented within it. The prediction doubtless will turn out to be too strong, but even partial confirmations across languages would offer new insights into the role of predictability, productivity, and statistical patterns in influencing grammar and linguistic performance. Preliminary evidence that fits into the framework may be found in aspects of Yiddish

An especially interesting tenet of the theory is that high type frequency (i.e., majority status among the vocabulary items in a category), though virtually a definition of "regular" in traditional grammar, is not among the criteria for regularity in its psychological sense; the fact that the majority of English nouns and verbs are regular is largely an accident. In German, for example, it appears that the default (phonologically and lexically unrestricted, ceteris paribus) plural is -s, while the most common plural (by far) is -en. In Arabic, the most common plural type is an internal modification called the "iambic plural" in McCarthy & Prince's (1990) detailed study of the phenomenon; yet the default, used for noncanonical forms, is suffixation. To date, connectionist modelers have assumed an equation between "default" and "most common," and connectionist models are in fact extremely sensitive to frequency with which data is presented to them (Plunkett and Marchman, 1991). We believe that cases like German and Arabic default structure disconfirm the naive statistical interpretation of the notion "default" and will turn out to motivate the rule/memory distinction fundamental to our approach: defaults are rules, and are therefore learned and implemented by different mechanisms from other patterns of limited applicability.

Indeed, it is conceivable that the majority status of regular verbs and the default nature of the regular rule may have been dissociated in earlier stages of English, with their current confounding a contingent historical product. The strong verbs in Modern English are fossils of Indo-European ablaut classes, presumably governed by rules whose lawfulness was obliterated by sound changes by the time of Proto-Germanic. The weak -d suffix was introduced in Proto-Germanic and appears to have been used there and in its immediate descendants for derived forms and borrowings (Pyles and Algeo, 1982). Two distinctive traits of Modern English are that it borrowed many of its verbs from French and Latin (perhaps 60-65%), and that it formed large numbers of its other verbs from nouns (perhaps another 20%) — both of which are default circumstances that call for the regular suffix. (These rough estimates, computed by Michelle Hollander, are based on a sample of 200 verbs drawn randomly from the approximately 4000 in Francis & Kucera, 1982.) Thus the preponderance and heterogeneity of regular verbs in English might be an epiphenomenon of the rule-like default nature of the suffixing process, rather than vice-versa. If so, it would be getting it backwards to simulate the mental process of regular inflection by exploiting the statistics of modern English, and the strategy should fail outright in modeling the regular processes in languages like Arabic and ancestors of Modern English where the most frequent inflections do not correspond to the the default inflection.

Finally, the psychological correlate of a theory of universal morphology is a learning theory for morphology, currently all but nonexistent (see MacWhinney, 1978, Pinker, 1984, and Pinker & Prince, 1988, for first attempts). The two kinds of theories may be related as follows. The universally diagnostic contingencies between patterns of output forms and kind of underlying morphological process, taken from the work on Universal Morphology, are a suitable candidate for the cues that the child uses in determining whether he should store a pair of items in memory or coin a rule based on them, and whether or not to permit patterns of each type to feed or be fed by other morphological relations; such proposals can then be submitted to additional developmental tests (see, e.g., Pinker, 1984). Currently a variety of learning procedures of varying degrees of plausibility can be envisioned.
For example, a priori one might suppose that the child memorizes pairs, and elevates their shared pattern to "rule" status once the pattern is seen to apply to a large number of types, to a diversity of types, to words belonging to every competing pattern, and/or to exocentric forms. Crosslinguistic work, and examination of the linguistic input available to children by the time they appear to use rules, are required to weed out the obviously incorrect possibilities from such a list.

Similarly, one can ask whether the child determines the feeding relations in the grammar (a) by having Kiparsky's (1983) three levels innately built in; (b) by having a more general capacity for constructing layered morphology, such as a default in which only stored words feed morphological rules (Aronoff, 1976) and rules making syntactically-relevant distinctions are placed after all others (Anderson, 1984), which is then articulated and ramified as specific input words produced by multiple rule application are analyzed; or (c) only a large set of selection restrictions among pairs of rules, posited individually in response to the relevant complex form in the input, are posited by the child. Again, further crosslinguistic and developmental data are needed to distinguish the possibilities.

Conclusion

What, then, does the multidisciplinary study of regular and irregular morphology have to teach us about the psychological status of grammatical rules and principles? If the current conclusions hold up, they portray the regular affixation rule as a linguistic process with some interesting properties. The process appears to be modular, not directly governed by any aspect of real-world knowledge, nonassociative (unaffected by frequency and similarity), sensitive to highly abstract formal distinctions (root versus derived, noun versus verb), developing on a schedule not timed by environmental input, organized by principles that could not have been learned, possibly with a distinct neural substrate and genetic basis. Exactly these properties have been claimed for grammar as a whole (e.g., Chomsky, 1981), based on data concerning complex interactions among syntactic principles. Intriguingly, the claim also finds support in the details of a phenomenon as simple as the mental process of deriving walked from walk.

References


CONDITION DUPLICATION, PARADIGM HOMONYMY, AND TRANSCONSTRUCTIONAL CONSTRAINTS*

Geoffrey K. Pullum
University of California, Santa Cruz

Arnold M. Zwicky
Ohio State University and Stanford University

Recent proposals eliminate familiar notions like "rule" and "construction" from syntactic theory; the oxymoronic-sounding phrase "rule-free grammar" has become a slogan for some syntacticians. Consider this quotation from Chomsky (1989: 43), for example:

...within syntax..., there are no rules for particular languages and no construction-specific principles. A language...is not, then, a system of rules, but a set of specifications for parameters in an invariant system of principles of universal grammar (UG); and traditional grammatical constructions are perhaps best regarded as taxonomic epiphenomena, collections of structures with properties resulting from the interaction of fixed principles with parameters set one way or another.

The idea is to reduce grammar entirely to (a) universal constraints and (b) non-universal (henceforth, parochial) settings for certain parameters. Parochial construction definitions — syntactic rules in the traditional sense — are eliminated completely. The very notion of a construction is dismissed as an artifact of outmoded assumptions.

However, filters that apply across constructions are assumed to exist, and one kind of parameter that may participate in defining a given language is an indication that a certain filter defined in universal grammar applies or does not apply. The Null Subject Parameter (determining whether constraint (9) of Perlmuter (1971: 100) holds) is one example. Another (very relevant here), is the parameter proposed by Longobardi (1980: 139), determining whether adjacent verbs are permitted to have identical inflections. In this paper we will use the term transconstructional to describe statements of this sort that apply to syntactic configurations without regard to what construction they represent.

This paper, like Fillmore (1988), adopts diametrically different assumptions. We take a grammar to be simply a set of construction-particular rules (partly universal and partly parochial in their formulations). We regard the notion of a construction as the crucial basis of syntax, and we think parochial transconstructional constraints probably do not exist at all. We develop this counterpoint to current trends by re-examining a classic transconstructional filter in English, Ross's "Doubl- ing" constraint, and showing, contrary to all previous
accounts, that it is a condition on a single construction-defining rule.¹

Ross gave specific arguments for the transconstructional character of Doubl-ing. We will first review and amplify these, and then subvert and nullify them. If we are successful in the case of the Doubl-ing constraint, it becomes more plausible to think that all parochial transconstructional constraints might similarly dissolve.

1. The Doubl-ing constraint. Ross’s Doubl-ing constraint is motivated by the ungrammaticality of strings like (1).

(1) *Keeping doing silly things like that would be a bad idea.

Ross’s formulation referred to a surface configuration in which a verb ending in -ing was sister to a clause whose main verb also ended in -ing. He argued that global and perhaps transderivational codicils are called for. First, to predict grammaticality for cases like (2), where the clause following the first verb is not its complement (under classical TG assumptions it is a raising-derived object, and in current analyses it would be a subordinate clause sentential subject), he proposed a global condition requiring that the second verb be subjacent to the first in deep structure.

(2) Your expecting breathing deeply to benefit us is naive.

And second, to exempt certain matrix verbs from the constraint (as in Lee’s resenting getting photographed drunk, which is grammatical), Ross noted, but did not formally incorporate into his final statement of the constraint, a transderivational generalization (suggested by George Lakoff) attributing the grammaticality of (3a) to the existence of (3b).

(3) a. Lee’s resenting getting photographed is silly.
   b. Lee’s resenting Chris’s getting photographed is silly.

Milsark (1972) made a valuable contribution to the discussion of the Doubl-ing constraint by applying some observations of Emonds (1970), who argued that the complement of a verb like enjoy had NP properties but the complement of a verb like start did not. Milsark noted that where Emonds’ tests confirmed NP status for the complement, the Doubl-ing constraint did not apply:

(4) a. Robin was enjoying going to concerts frequently.
   b. *Robin was starting going to concerts frequently.

This eliminates the need for a global condition to allow for (2), since breathing deeply is a nominal gerund phrase in that example, and it obviates the transderivational reference permitting (3a), since there getting photographed drunk is a nominal gerund phrase.

Subsequent refinements of Milsark’s statement by Emonds (1973) and Pullum (1974) arrived at a statement of the Doubl-ing constraint along the lines of (5):
Filter out surface structures, from whatever source, in which an \(-ing\)-suffixed verb has an immediately following non-NP complement with an \(-ing\)-suffixed verb.

We are concerned with explicating the words "from whatever source" in (5); if there are two or more "sources" for either or both of the \(-ing\)-suffixed verbs referred to in (5), then we apparently have evidence that the constraint must be transconstrualional.

An additional point about (5) is that it refers to the morphological composition of syntactic words (by saying "suffixed"), and to the phonological makeup of morphemes within those words (by saying "\(-ing\)"), so (5) violates the Principle of Morphology-Free Syntax (or Strong Lexicalist Hypothesis) and the Principle of Phonology-Free Syntax (Zwicky 1969; Pullum and Zwicky 1988). (It was the unwelcome possibility that the Doubl-\(-ing\) constraint violated these two important principles that led us to reexamine it.)

1.1. Syntactic determinants of the form of the first verb. The ending on the first verb in a Doubl-\(-ing\)-offending sequence may be due to the demands of any of at least four different constructions. We illustrate the point with examples in which the first verb is the aspectual \textit{start}, which takes a verb-\(-ing\) complement (like \textit{keep}, \textit{stop}, \textit{continue}, etc.).

(6) a. The progressive (\textit{I was eating at 10}; *\textit{I was starting eating at 10}.)
   b. The nominal gerund (\textit{My eating shocked them}; *\textit{My starting eating shocked them}).
   c. The \(-ing\) exclamation (\textit{Me eating meat!}; *\textit{Me starting eating meat!}).
   d. The \(-ing\) postmodifier (\textit{Anyone eating is crazy}; *\textit{Anyone starting eating is crazy}).

A generalization would be missed if the constraint were located in the rules that give rise to these constructions. This is what Ross calls a condition duplication argument.

1.2. Syntactic determinants of the form of the second verb. A similar case can be made with respect to the second verb in a Doubl-\(-ing\) sequence. There are at least three different \(-ing\) complement types:

(7) a. Those governed by aspectual verbs (\textit{Organisms began containing DNA long ago}).
   b. Those in the progressive construction, which have a different semantics and a very strong anti-stativity restriction (*\textit{Organisms are containing DNA today}).
   c. Those with passive semantics (\textit{This needs washing}).
The Doubl-\textit{ing} constraint must apply to all of them. We illustrate this with examples in which the first verb is a nominal gerund:

(8) a. I began singing all day.
    *My beginning singing all day upset them.

  b. I was working on the book all day.
    *My being working on the book all day upset them.

  c. I needed examining by a psychiatrist.
    *My needing examining by a psychiatrist is upsetting.

Here we have a distinct condition duplication argument that is not made explicit by Ross but follows in the same spirit as the arguments he gave.

1.3. The morphological forms of the verbs. Two syntactically (and semantically) distinct, but phonologically identical, forms of the traditionally recognized verb paradigm are implicated in Doubl-\textit{ing} violations. We will call them the \textit{Progressive} and the \textit{Gerund}, after the constructions with those names; see (6a) and (6b), respectively. Once more it seems that it is the surface sequence of \textit{-ing}-marked verbs that must be filtered out regardless of syntactic or morphological provenance.

2. Reanalysis of the morphology. We deal first with the morphological point. We will claim that the traditional morphological analysis is simply wrong to postulate homonymy between the Progressive and the Gerund in English verbal paradigms. There is only one form here; we will refer to it henceforth as the \textit{Present Participle}.\textsuperscript{2}

2.1. Not multiplying categories: I. The mere fact that Present Participles occur in different syntactic contexts with different semantic interpretations does not show that different grammatical categories are involved. Icelandic, for example, is not assumed to have distinct categories for dative indirect objects, dative direct objects, dative subjects, dative prepositional objects, etc. These case forms have quite different syntax (and semantics), but no analyst of Icelandic would entertain the idea that each of them represented a distinct case; they are standardly treated as different “uses” of the same case (as in Andrews 1982).

The point here is that category distinctions should not be multiplied in the absence of phonological realization differences. The Icelandic dative case has a complex set of distinct realization for different classes of words, so that generalizations are clearly lost by treating the different syntactic uses as different morphological cases; but even where there are no realization differences, as with the English forms found in the gerund and progressive constructions, it is preferable to apply Occam’s Razor.
2.2. Not multiplying categories: II. One thing about the Icelandic dative is also true of English V-\textit{ing}: Many more than two category distinctions must be made. The logic that leads to distinguishing the Gerund from the Progressive in English morphology would lead to postulating not just two but as many as eight different V-\textit{ing} verb forms in English with different syntactic distributions and semantics:

\begin{enumerate}
\item a. Progressive -\textit{ing}:
\begin{quote}
I am \textbf{singing} a madrigal. (cf. *They are having died.)
\end{quote}
\item b. Gerund -\textit{ing}:
\begin{quote}
\textit{my singing} a madrigal; their \textit{having} died
\end{quote}
\item c. Exclamatory -\textit{ing}:
\begin{quote}
Just think: me \textit{singing} a madrigal!
\textit{Them having} died!
\end{quote}
\item d. Postmodifier -\textit{ing}:
\begin{quote}
\textit{Anyone singing} a madrigal must be mad.
\textit{Anyone having} died will be erased from the database.
\end{quote}
\item e. Adverbial -\textit{ing} (Silva 1972):
\begin{quote}
I’m going \textit{carol-singing}.
*They are going having died.
\end{quote}
\item f. Absolute -\textit{ing}:
\begin{quote}
With me \textit{singing} madrigals, everyone will be amused.
\textit{Having} died, they were no further use to us.
\end{quote}
\item g. Premodifier -\textit{ing}:
\begin{quote}
\textit{the questing vole}; the \textit{containing} wall
\end{quote}
\item h. Action-nominal -\textit{ing}, limited to verbs denoting actions:
\begin{quote}
\textit{My \textbf{singing} of} the madrigal took four minutes.
*\textit{their having} of the appearance of death
\end{quote}
\end{enumerate}
Surely postulating eight homophonous suffixes is somewhat profligate.

2.3. The unity of -\textit{ing}: I. We have argued that the reasoning that leads to a distinction between Progressive and Gerund forms in English is not sound. But there are at least two positive factual arguments against the distinction, based on rules of English that apply to all and only the verbal -\textit{ing} forms.

First, a phonological argument: all the occurrences are subject to the same alternation in shape between a velar and an alveolar nasal, -\textit{ing} versus -\textit{in’}. This affects the verbal suffix -\textit{ing}, not just anything that rhymes with it, as we can see from the fact that many speakers have a style of moderate informality in which verb forms like \textit{singing} occur but the noun \textit{building} would not be pronounced *\textit{buildin’}. These speakers would say \textit{puttin’ up some siding}, \textit{nailin’ down some planking}, or \textit{singin’ outside a building}, but not *\textit{puttin’ up some sidin’}, *\textit{nailin’ down some plankin’}, or *\textit{singin’ outside a buildin’}. This generalization about English phonology treats all the types of V-\textit{ing} as a class and distinguishes them from other words ending in an unstressed suffix -\textit{ing}. 
2.4. The unity of \textit{-ing}: II. Second, a morphological argument, noted by Kiparsky (1974): all and only the \textit{-ing} forms in the paradigm participate in the compounding process that incorporates non-subject nouns into their verbs, as in \textit{wine-making, spear-fishing,} and \textit{bicycle-riding}. There are incorporations involving all eight types of \textit{-ing}, as shown in (10), but no form other than the Present Participle is available: not the unmarked Present in (11a), nor the marked Present in (11b), nor the Past in (11c), nor the Past Participle in (11d), nor the unmarked Infinitive in (11e,f), nor the Base form in (11g).

(10) a. Progressive:  
They are bicycle-touring across France.
b. Gerund:  
Bicycle-touring across France is great.
c. Exclamatory:  
Them bicycle-touring across France!
d. Postmodifier:  
Anyone bicycle-touring across France must be crazy.
e. Adverbial:  
Let's go bicycle-touring across France!
f. Absolute:  
With Dana bicycle-touring across France, we were sad.  
Bicycle-touring across France, Dana found peace.
g. Premodifier:  
Bicycle-touring maniacs invaded the square.
h. Action-nominal:  
Their bicycle-touring across France took a week.

(11) a. *They bicycle-tour across France every summer.
b. *She bicycle-tours across France every summer.
c. *They bicycle-toured across France last summer.
d. *They have bicycle-toured across France every summer for years.
e. *We made them bicycle-tour across France.
f. *Please bicycle-tour across France this summer!
g. *I expect you to bicycle-tour across France this summer.

Again the generalization treats all the types of \textit{V-ing} as a class, opposed to all other forms.

Summarizing: first, it is unnecessary to distinguish two or more \textit{V-ing} forms (the differences can be associated instead with different rules referring to Present Participle form); second, it is cumbersome to do so (it forces a multiplication of categories); and third, it is actually wrong to do so (it misses generalizations). We conclude that the right formulation of the Doubl-\textit{ing} constraint mentions a grammatical category Present Participle, not a morphological notion like “the \textit{-ing} suffix” or a phonological one like “the shape \textit{-ing}.”
3. Undercutting the condition duplication arguments. We now turn to the condition duplication arguments of sections 1.1 and 1.2 and show that these collapse, given (a) direct phrase structure description of VP complementation and (b) the distinction between constituency rules and valency rules.4

3.1. Direct description of VP complementation. We begin by observing that it is necessary on a number of grounds to distinguish between (at least) two types of argument constituents for verbs, which we shall call direct objects and complements. This is a conceptual and terminological refinement of our earlier discussion, which used “complement” and “complementation” loosely, to refer to any sort of argument for a verb.

In English, direct objects (but not complements) are passivizable and tough-movable, while complements (but not direct objects) can have modifiers of the head verb intervene between them and this verb. In (12) we illustrate these points with the object-taking verb try, as in I’ve never tried sushi, and the complement-taking verb try, as in I’ve never tried to eat sushi.

(12) a. Passive:

   Several kinds of sushi have been tried by everyone I know.
   *To eat several kinds of sushi has been tried by everyone I know.

   b. Tough movement:

   Sushi is difficult for most people to try.
   *To eat sushi is difficult for most people to try.

   c. Intervening VP modifiers:

   *I have tried often sushi.
   I have tried often to eat sushi.

From such examples alone, one might conclude that the difference was merely a matter of whether the internal argument of the verb was an NP or not. But as is well known, NPhood is neither sufficient for passivization (many verbs occur with NPs that cannot be passive subjects), nor necessary (non-NP constituents with the same internal syntax may act like objects or like complements depending upon what head verb they combine with). In particular, there are present participial VPs of both types, with verbs like enjoy and relish occurring with arguments that act like objects and with most aspectual verbs (like start) and some others (for some speakers, (dis)like) occurring with arguments that act like complements:

(13) a. Object behavior with enjoy:

   Dining out is enjoyed by millions every day.
   Dining out is not hard to enjoy.
   *I enjoy enormously dining out.
b. Complement behavior with *start:
   *Dining out has been started by millions.
   *Dining out is not hard to start.
   We started long ago dining out.

3.1.1. Reference to grammatical relations. We will assume here, uncontentiously, that rules can refer in some way to the relations "object" and "complement". It does not matter whether they do this à la relational grammar by direct reference to the grammatical relations Object-of and Complement-of, or via an NP versus non-NP categorial distinction à la Emonds (1970). Some realization of the distinction, however, is crucial to our statement of the Doubl-ing constraint.

   It is well known that not all combinations of present participial head verb with a present participial non-subject argument violate the constraint, or at least that some of these combinations exhibit lesser degrees of unacceptability than examples like *It is stopping raining, and it is known that there is some variation from verb to verb and from person to person in these judgments. For us, the verbs that are fully grammatical in the doubl-ing configuration include those in (14a), as in (15a), while the verbs in (14b) are less acceptable, as in (15b); other speakers report other patterns of grammaticality.

(14) a. avoid, dread, enjoy, forget, recall, recommend, relish, remember
   b. like, dislike, hate, try

(15) a. I'm really dreading eating raw octopus.
   b. *These days I'm liking eating raw octopus less and less.

We explain this distinction by claiming that direct object VPs, as in (15a), are not subject to the Doubl-ing constraint, and complement VPs, as in (15b), are subject to it. The word "complement" in (5) above is correct, but must be taken in its narrower sense.

3.1.2. Constructions and rules. Our next point arises from the observation that there is no one-to-one correspondence between (i) verb subcategories, (ii) formal properties of complements, and (iii) semantic concomitants of verb-complement combinations. Rather, we have a set of constructions, each with its own formal requirements on the participant constituents, its own subcategory for the head, and its own semantics (Zwicky 1987).

   The standard analytic strategy of generative syntax distinguishes constructions via representation differences. Syntactic rules are conditions on the well-formedness of representations, and do not necessarily correspond at all closely to constructions. In a framework with no parochial rules but only parameter settings, there is nothing that corresponds to an individual construction. In either case, we expect transconstructional constraints.
In a construction-based framework for syntax, in contrast, the natural arrangement is for each rule to be a description of one construction and for each construction to be described by one rule. Anything other than this direct alignment of rules and constructions — in particular, any sort of transconstructional constraint — constitutes something of an anomaly.

Our previous discussion has eliminated much of the transconstructional character of the Doubl-ing constraint. Suppose for the moment that the only English construction combining a V head with a present participial VP complement was the one that was the focus of all the original discussion of the constraint, namely the aspactual construction with stop, start, etc. Then it would suffice to constrain this one rule not to apply if the head V has the present participle form. This formulation would generalize across all the sources for the present participle form on the first verb.

The only transconstructional characteristic of the constraint that remains is the generalization across (at least) three different sources for the present participle form on the second verb. We now turn to the analytic step that removes this too.

3.2. The distinction between constituency and valency rules. The second analytic step we make is to distinguish between constituency rules, which express generalizations about constituent inclusion and linear ordering, and valency rules, which express generalizations about the compatibility of heads with dependents bearing particular grammatical relations. Constituency rules make no reference to what specific types of dependents different subcategories of head may demand. Valency rules make no reference to how the participants in grammatical relations are organized into constituents or ordered with respect to one another. Both sorts of rules, of course, refer to syntactic categories, and one rule can depend upon or invoke the conditions in another (Zwicky 1989). We will illustrate with some rules from English, listed in (16) – (20) below.

The content of rule A is universal, though a given language may either have two-argument adjectives or happen to lack them. Other rules of English require oblique objects to be marked with prepositions, the default preposition being of, and thus rule A licenses combinations like sure of NP, aware of NP, etc.

(16) Rule A (valency):

An adjective head word is compatible with a subject constituent and an oblique object constituent.

Such an adjective and its object can then be “assembled” by rule B, with X instantiated as A, into an AP (adjective phrase) constituent like sure of your answer.

Rule B has a universal portion (essentially rule 2 of Pollard and Sag 1987:151), plus several codicils specific to English, including the two given below that impose ordering conditions on the daughter constituents of phrases:
(17) Rule B (constituency):

(universal) An X-phrase can be composed of an X head and all the non-subject arguments licensed for it by some valency rule.

(parochial) 1. The X head is leftmost.

(parochial) 2. A direct object, if there is one, immediately follows the X head.

The content of valency rules C and D is universal. Rule C licenses an adjective phrase like *sure of your answer* in the predicative grammatical relation. Rule C is used by rule D, which licenses copular verbs like *be* as heads with subjects and predicatives. Rule D includes a clause by which such a copular verb “inherits” its subject from a subsidiary construction.

(18) Rule C (valency):

An adjective phrase can serve in the predicative relation.

(19) Rule D (valency):

A verb head is compatible with a subject constituent and a predicative constituent, the latter comprising a subsidiary head and any number of dependent constituents, where some valency rule licenses the compatibility of this subsidiary head with this subject and these other dependents.

Rule D in turn is invoked by constituency rules B and E; with $X = V$, B combines verbs and their non-subject arguments to make verb phrase constituents like *be sure of your answer, become an opponent of the government, and send flowers to the judge*. Finally, E combines verbs indirectly (via the mediation of a VP constituent) with all their arguments, to make clause constituents like *you be sure of your answer* (as in *I insist that you be sure of your answer*). Like B, rule E (roughly rule 1 of Pollard and Sag 1987: 149) has a universal portion, building a clause from a subject and a compatible X-phrase predicate, and portions specific to English, requiring that the predicate be a verb phrase and ordering the subject before the predicate.

(20) Rule E (constituency):

(universal) A clause can be composed of an X-phrase constituent licensed by rule B and a subject constituent, where some valency rule licenses the subsidiary head $X$ with this subject and its other arguments in the X-phrase.

(parochial) 1. $X$ is $V$.

(parochial) 2. The subject precedes the X-phrase.
3.3. **Formulation of the Doubl-\textit{ing} constraint.** We are now close to eliminating the last remnants of transconstructionality from the statement of the Doubl-\textit{ing} constraint. The remaining apparent problem is that, as noted above, there are at least three rules combining a verb head with a Present Participle VP complement: one rule for an aspeuctual construction, one for a progressive construction with head verb \textit{be}, and one for a "passive" construction with head verb \textit{need} or \textit{want}, as in (7). Each is a valency rule, with a condition by which the construction in question "inherits" its subject from a subsidiary construction.

Other valency rules of English license head verbs with VP complements of other types, with predicatives, with objects of various types, or as occurring intransitively, without an object. All of these valency rules can be called upon by the constituency rule B above with $X = V$, which "assembles" a verb head and all its non-subject arguments into a VP. Our claim is that it is this one constituency rule that is subject to the Doubl-\textit{ing} constraint, and not any of the valency rules invoked by rule B. This is a third parochial condition on rule B:

\begin{equation}
\text{(21) The Doubl-\textit{ing} constraint: Rule B is inapplicable if its head V and an immediately following head of a complement VP are both in Present Participle form.}
\end{equation}

In (21) we have a constraint on one construction-defining rule of English, the one for the standard verb-initial VP. This rule does not need to mention that any one of four or more rules might be the source of the requirement of Present Participle form on the head verb; nor does it need to mention that any one of three or more rules might be the source of the requirement of Present Participle form on the complement VP.

3.4. **Inconstancy.** A condition on a valency rule applies constantly throughout all invocations by different constituency rules. However, a condition on a constituency rule, like (21), will not apply to other constituency rules, even when the same valency rules are invoked; such a condition will appear to be "inconstant" or subject to what Ross has called an "amnesty". Inconstancy served as one of Ross's types of argument for the transconstructional character of the the Doubl-\textit{ing} constraint: the argument from necessary intermediate stages.

Consider a condition that is constant: the membership of verbs in the subcategory of head words for valency rule D. The verb \textit{be} occurs with predicatives, but \textit{exist} does not, as in (22a) below. This condition continues to hold even if the head verb and the predicative are not together in a single VP, as in (22b, c).
(22) a. They were sure of their answers.
    a'. *They existed sure of their answers.
    b. How sure of their answers were they?
    b'. *How sure of their answers did they exist?
    c. They remain \( \emptyset \) today, and were \( \emptyset \) a month ago,
    c'. *They remain \( \emptyset \) today, and existed \( \emptyset \) a month ago, completely sure of
their answers.

Contrast this with doubl-\textit{ing} violations, which disappear (as Ross noticed) when
the two Present Participle forms are not together in the same phrase:

(23) a. I was hoping they would stop singing, and now Kim is indeed stopping
    \( \emptyset \).
    b. Kim neither was stopping \( \emptyset \), nor ever intended to stop \( \emptyset \), singing.

Ross assumed that strings like *\textit{Kim was stopping singing} had to appear as
intermediate stages in the derivations of examples like those in (23).

We deny that an intermediate representation has to be posited here. The
valency rule for aspecual verbs says that the verb \textit{stop} is compatible with the
subject \textit{Kim} and the Present Participle complement VP \textit{singing}, and since this rule
places no conditions on the form of the head verb, the Present Participle \textit{stopping}
is compatible with these arguments as well. A problem arises only when we put
\textit{stopping} and \textit{singing} together in a VP by constituency rule B, which is subject to
constraint (21). When VPs are licensed by rules that do not call for a VP
complement, as in the examples in (23), there is no problem in having the head
verb form \textit{stopping}, since these other rules are free of constraints like (21).

Thus our analysis, which locates the Doubl-\textit{ing} constraint on the constituency
rule for \( X \)-phrases, makes correct predictions about where the constraint fails to
apply.

3.5. Immediate adjacency. If the Doubl-\textit{ing} constraint was a condition on one
or more valency rules, then we would expect no reference to linear order in it;
conditions on linear order are imposed not in valency rules but in constituency
rules. Earlier formulations of the constraint, however, implicitly or explicitly call
it up only for adjacent Present Participle forms, and we have carried this
restriction through to our formulation in (21). Insofar as the restriction applies
only to immediately adjacent forms, we have a further correct prediction from
treating it as a condition on a constituency rule.

English verbs that are compatible with both a direct object and a Present
Participle complement VP provide clear evidence for the adjacency restriction.
When the complement VP is separated from the head V by the direct object, the
Doubl-\textit{ing} constraint is not infringed, so (24a) is fine. But when the second
parochial condition on rule B is lifted, in "heavy NP shift" examples like (24b),
so that the complement VP can immediately follow the head, a violation of the Doubl-\textit{ing} constraint results, as in (24c).

(24) a. We were getting everyone singing in tune.
   b. We got singing in tune everyone who came to the festival.
   c. *We were getting singing in tune everyone who came to the festival.

Conversely, whenever other rules license material that can intervene between the head V and its complement VP — whether this intervening material forms a constituent with the head (as in (25a)), forms a constituent with the complement (as in (25b)), or is a sister constituent to them both (as in (25c)) — the resulting examples seem fine, or at least dramatically improved.\footnote{7}

(25) a. I'll be keeping right on singing even after you stop.
   b. I'll soon be starting regularly going to church.
   c. I'll soon be starting, as you probably already realize, eating only salads for lunch.

4. Conclusion. The Doubl-\textit{ing} constraint as restated in (21) lends no support to the idea of filters or other transconstructional constraints, or to any of the weakenings of linguistic theory that have been associated with previous formulations. Our statement is nonglobal, nontransderivational, and free of syntactic reference to morphology or phonology. One implication is that early criticisms of global and transderivational constraints are borne out: such devices are not needed to capture the Doubl-\textit{ing} generalization. Another is that the mutual autonomy of syntax, morphology, and phonology is supported. And a third is that since the transconstructionality of the Doubl-\textit{ing} constraint had been argued by Ross with unusual care, our result locating it on a construction-defining rule undermines the “rule-free grammar” program.

We are prepared to argue (though not here) that all the parochial transconstructional syntactic constraints that have been proposed in the literature, beginning with Ross (1967) and Perlmutter (1971) and continuing through Longobardi (1980), are either (i) not parochial, but universal; or (ii) not syntactic, but rather morphological (like many clitic ordering constraints) or prosodic (like conditions on the stranding of words with particular accentual properties); or (iii) not grammatical generalizations at all, but rather statistical tendencies or stylistic preferences (e.g. constraints referring to length and complexity); or (iv) not transconstructional, but rule-particular, like Doubl-\textit{ing}.

NOTES

* This paper was written at the Center for Advanced Study in the Behavioral Sciences (CASBS). Pullum is grateful for financial support from a fellowship provided under National Science Foundation grant BNS 8700864 to CASBS and from a sabbatical leave granted by the University of California, Santa Cruz. Zwicky is grateful for sabbatical
support from the Ohio State University.

1 Bolinger (1979) has suggested that there is no grammatical constraint here at all, merely a dispreference for successions of "jingling" words in sentences. He points out that we would similarly avoid locutions like *Was his the token taken?*. Undoubtedly there are dispreferrences for some of the jingles in Doubl-"ing examples, even those we have judged to be fully grammatical, but for many speakers of English the constraint is quite specific, even limited to specific verbs, and not at all fuzzy. There might well be many other speakers who lack the constraint, and merely find examples like those in (6) awkward, but this possibility should not divert us from considering the grammar for those speakers whose judgments are clear-cut.

2 Quirk et al. (1985) refer to it as "participle -"ing".

3 The generative literature either avoids the question of what the verb forms in (9c–h) are or assumes that a form that doesn't have the action semantics of the progressive is a gerund. Ross (1972), for instance, takes the first tack, while Gazdar et al. (1982: 597) take the second, at least with respect to absolutes like those in (9f). But there are gross distributional and semantic differences between gerunds and absolutes.

4 The full taxonomy of rule types includes two others, concerned with sentence types and with anaphoric elements, and is thus that of Bloomfield (1933) on construction types, but with his constituent structure constructions split into two types.

5 Strictly speaking, it is the *functor* word that is relevant for subcategorization in the "lexical" generalizations: the head word in a combination of head with arguments, the modifier word in a combination of modifier with head.

6 A description of this sort is reminiscent of descriptions in Lexical Functional Grammar (Bresnan and Kaplan 1982) or Head-driven Phrase Structure Grammar (Pollard and Sag 1987), but in constructing a theory of grammar we would not necessarily adopt all the specific assumptions made by LFG and/or HPSG.

7 Some speakers judge some of these examples to be less than fully acceptable, presumably because of a residual "jingle" effect in the sense of Bolinger (1979).

REFERENCES


Cambridge MA.


The development of nominal/non-nominal class marking by tone in Shimen Hmong

Martha Ratliff
Wayne State University

1. Introduction.

Tone in the Shimen dialect of Hmongic (called by its speakers aⁿⁿ - maauⁿⁿ) spoken in Weining district, northwest Guizhou province, China is atypical not only of the Hmong-Mien (Miao-Yao) family but also of the dialects of Hmongic most closely related to it, in that one of its functions is to mark a nominal/non-nominal contrast in three of its eight historical tone categories.¹

(1)

A
   1 → 55 taⁿⁿ "thick"
   2

B
   1 → 55 taⁿⁿ "to shake hands"
   2 → I(nom)
       → II(non-nom) 33 daⁿⁿ "large bowl"
   → II(non-nom) 11 doⁿⁿ "to wait"

C
   1 → I(nom)
   2 → II(non-nom) 53 dzauⁿⁿ "chisel"

D
   1 → I(nom)
   2 → II(non-nom) 31 daⁿⁿ "to die"
   → II(non-nom) 11 taiⁿⁿ "to pick up"
       53 dauⁿⁿ "bean"

In the leftmost column, the letters "A", "B", "C", and "D" represent Proto-Hmong-Mien tone categories. The primary split of each of these original tones into subcategories "1" and "2" was conditioned by the feature of voicing in the initial consonant. The number "1" tone words originally had voiceless initials and the number "2" tone words originally had voiced initials: in Shimen this contrast is retained. The development of the secondary split according to word class membership is the object of the present study. Following are some pairs exemplifying this tone split in categories B2 and C2 (minimal pairs in D2 are
lacking to me). These pairs, whether corresponding to one root or two, would be homophonous in other Hmong dialects:

(2)  

<table>
<thead>
<tr>
<th>nominal</th>
<th>non-nominal</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2:</td>
<td></td>
</tr>
<tr>
<td>mọ́33 &quot;fly&quot;</td>
<td>mọ́11 &quot;fine&quot; (adjective)</td>
</tr>
<tr>
<td>ndzie33 &quot;a braid of hair&quot;</td>
<td>ndzie11 &quot;to braid&quot;</td>
</tr>
<tr>
<td>νwu33 &quot;urine&quot;</td>
<td>νwu11 &quot;to urinate&quot;</td>
</tr>
<tr>
<td>C2:</td>
<td></td>
</tr>
<tr>
<td>ndlo53 &quot;interior&quot;</td>
<td>ndlo31 &quot;to rest on&quot;</td>
</tr>
<tr>
<td>ṅṭau53 &quot;young man&quot;</td>
<td>ṅṭau31 &quot;to pick&quot;</td>
</tr>
</tbody>
</table>

(Wang 1979)

Marking of major word class by tone is quite rare in Asian tone languages generally, but is common in African tone languages. An account of the development of grammatical tone in this Asian language is thus important as a case study in typological change.

This study of the function of tone in Shimen Hmong is part of a larger typological study of tone languages being conducted by the author (Ratliff 1991a and 1991b). In this larger study, tone function is used as an entrée into the delineation of networks of tone language features. Although often supported and sometimes induced by language contact, tone language type change is understood as triggered by a change in one or more of the features of these networks which ultimately leads to a change in possible tone function. This is the path which I claim Shimen has taken to arrive at its present areally uncharacteristic shape.

Most Asian tone languages are characterized by lexical tone and, optionally, morphological tone which affects only small word classes, performs evalutative functions, or performs discourse functions. These tone functions are related to other features of Asian languages, namely, the absence of extensive segmental morphology and limited resources for word-building. Tones must be used primarily to generate more lexical contrasts since there are few other devices available to do so. If grammatical marking of large word classes by tone were to take place, the primary function of tone in these languages would be cancelled out. It therefore does not occur except in cases like Shimen, where we can see what may be a type change in progress. Tonal marking of large word classes in Shimen is able to develop because of the concomitant presence or development of certain related features of its tone language network: Shimen has developed limited segmental morphology, namely prefixes and ablaut evaluative morphology (Wang 1957, 1983), and has retained the old voicing contrast in initial consonants, a contrast levelled in most other dialects. These two facts set the stage for the development of a type of tone sandhi which spreads the tone of a word or prefix rightward across a voiced consonant. I will demonstrate that the tone split in categories B2, C2, and D2 is dependent on the existence of old nominal or nominalizing prefixes and reflects the historical effects of a type of tone sandhi which is still present in the dialect.

I would like to acknowledge my debt to Wang Fushi of the Institute of Nationality Studies, Chinese Academy of Social Sciences, who is the senior authority in the
field of Hmong-Mien historical and descriptive studies. He is also the individual who knows Shimen Hmong best, based on his field work in Guizhou province, his collaboration with Wang Deguang, a native speaker of the Shimen dialect and trained linguist, and the resultant studies of various aspects of this dialect which have been published in four long and detailed articles (1957, 1982, 1983, 1984). Surprisingly, in his published work Wang makes no attempt to explain the origin of the grammatical marking by tone that he reports. I have decided to undertake this task, but with the awareness that it is wholly dependent on Wang's important work.

2. The historical development of Shimen class marking by tone.

2.1. Determination of the original B2, C2, and D2 tones.

The first step in solving the puzzle of the unusual word class marking by tone in Shimen involves making a hypothesis as to which of each pair, the nominal tone or the non-nominal tone is the original tone and which is the derived tone. Four facts argue for the non-nominal tone as the original and the nominal tone as the derived in each case.

2.1.1. Breathy phonation in tones A2, B2II, and D2II. The syllables to which number 2 tones are associated (the "yang" tones in the Hmong-Mien, Chinese and Tai-Kadai families) had, or, in the case of Shimen Hmong, still have, voiced initial consonants. The feature of voice in initial consonants has been associated by many scholars with the development of breathy phonation in adjacent vowels: see, for example, see the work of Sherard (1972), Diffloth (1984), and Solnit (1989) on languages as diverse as Shanghai, Mon, and Kayaw. The languages and dialects of Hmong-Mien show this same association. A Chinese Academy of Sciences survey team (1959) reports that syllables associated with tones B2 and especially C2 (and, occasionally, tones A2 and D2) across the Hmongic family are typically characterized by initials with voiced aspiration, which is equivalent to what western scholars would characterize as breathy phonation on the syllable level. The breathness associated with the non-nominal tones A2, B2 (non-nominal) and D2 (non-nominal), then, probably was associated with the pre-split values of tones A2, B2 and D2. The fact that the yang tone which did not split, tone A2, is characterized by breathness lends further support to this hypothesis.

2.1.2. Homogeneity of the nominal classes. A second strong argument for the non-nominal tones as the original B2, C2, and D2 tones is the limitation of the nominal tones to use with monosyllabic nouns and classifiers. To the "non-nominal" tones, words of all other parts of speech within these historical tone categories are assigned. In line with generally accepted linguistic practice, it makes sense to identify the derived form as the one with the more restricted (and predictable) use. The same observation must have led Wang (1984: 59 ff) to make the practical suggestion that the non-nominal tone be used in any writing system developed for Shimen Hmong, since the nominal tone can be figured out by the reader/writer through the application of a single rule.

2.1.3. Limited size of the nominal classes and variation in speech. Finally, Wang reports that the number of words in the three nominal classes are fairly small. He further reports that there is some variation in the tonal realization of these nominals between the value of the nominal and the non-nominal tones. He reports no equivalent variation in the pronunciation of the non-nominals (Wang 1984: 61,71).
2.2. Hypothesis for the development of the nominal tone classes. With the probability of the greater antiquity of the non-nominal tone thus established, we can now proceed to a discussion of how the nominal tone classes developed.

There is very good indirect evidence that nominal and/or nominalizing prefixes caused the root tone of nouns in tone categories B2, C2, and D2 to change. These prefixes subsequently disappeared, giving rise to a class of tonally marked nouns. It is not clear which prefixes disappeared or under what circumstances they disappeared. However, much can be inferred about the nature of the tone relationship between them and the tones of their roots. I believe that the exclusion of tone A2 from this secondary split can be explained as a consequence of the nature of this prefix-root tone relationship. Further, I think we have enough evidence to understand why this split was confined to syllables with voiced initial consonants. Finally, we can make an educated guess about the semantic and phonological nature of these prefixes.

First, however, I would like to briefly establish why such a development would not be unexpected in a member of the Hmong-Mien family based on the widespread existence of prefixes, tone sandhi affecting roots following prefixes and subsequent prefix loss in both Shimen and in other dialects.

2.2.1. Family precedents for separate aspects of the hypothesis.

2.2.1.1. The presence of nominal and nominalizing prefixes in the family and in Shimen. Nominal prefixes have been recorded for several dialects related to Shimen as well as for Shimen itself. Although semantically like classifiers, prefixes are obligatorily present in every syntactic environment. Some examples are given below:

(3) Dananshan (West Hmongic) (Wang 1985)
    so 43- parts of body
    qa 43- humans, abstractions ...

Meizu Bunu (West Hmongic) (Mao, Meng, Zheng 1982)
    ka 33- insects, vegetables
    pu 43- animate, human

Yanghao (East Hmongic) (Wang 1985)
    tp 31 33- humans
    e 33- names

Layiping (North Hmongic) (Wang 1985)
    q 35- humans, names, plants ...
    ta 35- animate non-human, natural forces

Nominalizing derivational prefixes have been reported in other dialects as well. Examples appear below:

(4) White Hmong (West Hmongic) (Xiong et al. 1983)
    ke 24-

Meizu Bunu (West Hmongic) (Mao, Meng, Zheng 1982)
    pu 33-
    ta 22-
Although possibly the result of the fact that there is more published information on Shimen than on any other West Hmongic dialect spoken in China, Shimen seems to be characterized by more prefixes than other members of this branch of the family. There is at least one example of a derivational prefix in Shimen, and that is the prefix "a-" (with variable tone) when used with a classifier. With the addition of this prefix, classifiers become "abstract nouns" according to Wang. The example reproduced below seems to indicate that the derived noun plays a role in partitive constructions:

(5)  
\[ \text{tae}^{55} \quad \text{ta}^{55} \quad \text{bau}^{35} \quad \text{ni}^{55} \quad \text{ta}^{33-} \quad \text{lo}^{55} \quad \text{ta}^{55-} \quad \text{die}^{31}. \]

some clf flower this (of)bud(s) big very "(As to) some (of) these flowers...the buds are very big."

(Wang 1957: 132)

This brief sampling suggests that it is not unlikely that a nominalizing prefix or prefixes would have been available to play a role in the development of tonally marked word classes in Shimen.

2.2.1.2. The evidence of prefixes causing tone change in the root syllable. To yield the desired result, however, we must be convinced that this hypothetical prefix could have plausibly altered the tone of the root to which it was attached. This needs to be demonstrated, because there are word classes which do not typically induce tone change in following words of certain other classes. For example, Wang specifically mentions the general inability of classifiers and verbs to cause tone change in following nouns (1984:18). This is true of the dialect I have studied closely as well, White Hmong of northern Southeast Asia (West Hmongic).

Prefixes cause tone change in a following root in the modern form of the language as described by Wang (1957, 1984). His examples include prefix-classifier, prefix-noun, and prefix-verb (limited to the only two verbal prefixes: the reciprocal and the negative). The prefix-root relationship constitutes an example of the usual sandhi domain in Hmongic: two morphemes not separated by a major constituent boundary standing in a close semantic relationship to one another. Other examples are the numeral-classifier collocation and the noun-noun compound collocation.

The tone change a prefix can effect upon a following root in Shimen can represent either one of two types of rightward tone sandhi. The first is a paradigmatic replacement type of tone sandhi which is of some antiquity (Downer 1967, Wang 1979, 1984, Ratliff 1987). I will refer to this system as the "West Hmongic" type, since it appears in several dialects of this branch. Although doubtlessly phonetically motivated at some point, it no longer appears to be so today. There is also a later tone sandhi system peculiar to Shimen which is possible, in the main, to describe phonologically. I will refer to this system as the "Shimen" type (Wang 1984: "tone change in liaison"). The complementary roles of these two types of tone sandhi in Shimen is crucial to the solution of this historical problem. Both will be discussed fully in section 2.2.2.1 below.

2.2.1.3. The link between tone change and subsequent prefix loss. In his 1979 comparative study of Hmongic initials and finals in nine dialects, Wang convincingly uses the "disappearing prefix analysis" to account for cognates with
had altered the tone of the cognate according to the rules of the West Hmongic tone sandhi system. Examples of roots with anomalous tones in Shimen explained in this way include (1) Shimen tʂʰɑi⁴¹ (D1) "half (catty)" corresponding to words with C1 in 4 other dialects, whose tone Wang attributes to the influence and subsequent loss of the numeral "one", and (2) Shimen lɑu⁴³ (C1) "cock" corresponding to words with B1 in 5 other dialects, whose tone Wang attributes to the influence and subsequent loss of a prefix (Wang 1979: 35, 69).

A second piece of evidence for the derived nominal tone as a trace of an old prefix in Shimen involves an interesting set of exceptions to the word class assignment by tone in historical categories B2, C2, and D2. The only nouns which are not marked by the tone of the nominal class, but rather retain the older tone of the non-nominal class, are those which are prefixed, as exemplified below:

(6) "persimmon": noun with non-nominal tone B2II, prefix retained in kʰ⁵⁵-ʌe⁴¹
"tongue": noun with non-nominal tone D2II, prefix retained in a⁵⁵-ŋd¹i³¹
"bamboo": noun with non-nominal tone D2II, prefix retained in ᣱ⁵⁵-ŋey³¹

(Wang 1979: 37, 47, 73)

The clear conclusion to be drawn from this data is that in the very case we are interested in, nominal class membership is linked to the absence of a prefix: the one which I claim caused it originally to change tone. It is not clear whether these exceptions can be explained by the particular prefixes which remain or by the withering of the sandhi system that used to link the now-absent prefixes to their roots. I find the second explanation more likely since, as can be seen above, many prefixes are attested in these exceptional cases.

2.2.2. The mechanism of the change in Shimen.

2.2.2.1. The nature of the tone sandhi involved. To understand the nature of the tone sandhi which led to the tone split according to grammatical class, it is necessary to first review and compare the two types of tone sandhi operative in Shimen mentioned above: the West Hmongic type and the Shimen type.

The West Hmongic tone sandhi system involves the substitution of the reflex of one historical tone category for another in a word following a word with an A tone reflex. There are also restrictions on the type of syntactic relationship which must obtain between the trigger on the left and the affected syllable on the right. The substitutions, by historical category, appear below:

(7) A2
| B2 ---|--- C2 |
| D2 ---|--- A1 - |
| B1 ---|--- C1 |
| Cl ---|--- D1 - |

(Ratliff 1987: 97)
The examples from Shimen given in Wang's data involve only the last two rules on that list, such as:

(8)  tu\textsuperscript{55}  ki\textsuperscript{55}(B1) \to \hspace{1cm} tu\textsuperscript{55}-ki\textsuperscript{33}(C1)
son grandson
qu\textsuperscript{55}  t\texthbox{\textgreek{g}}\texthbox{\textho}\textsuperscript{33}(C1) \to qu\textsuperscript{55}-t\texthbox{\textgreek{g}}\texthbox{\textho}\textsuperscript{11}(D1)
old clothing

(Wang 1984: 19, 21)^4

Unlike the West Hmongic tone sandhi system, the complex "Shimen type" of tone sandhi can be described phonologically. The most general phonological rule we can extract from this system is that the tone of the second syllable of a disyllabic word or tightly-knit phrase (e.g. possessive-noun, numeral-classifier, verb-expressive) lowers to 31 when it is high falling, and to 11 in many other cases, as exemplified below. The concomitant change of phonation type indicates that this system also involves historical categories: for example, it is the B2II low level tone with breathy voice that shows up as the change tone in these examples, not the D1 low level tone with modal voice.

(9)  qha\textsuperscript{33}  va\textsuperscript{53} \to \hspace{1cm} qha\textsuperscript{33}-va\textsuperscript{31}
guest meal
ndzai\textsuperscript{53}  mo\textsuperscript{53} \to ndzai\textsuperscript{53}-mo\textsuperscript{31}
bundle of wheat
tu\textsuperscript{55}  ba\textsuperscript{31} \to tu\textsuperscript{55}-ba\textsuperscript{11}
son hug
la\textsuperscript{53}  nu\textsuperscript{33} \to la\textsuperscript{53}-nu\textsuperscript{11}
others horse
\textgreek{e}y\textsuperscript{11}  nu\textsuperscript{33} \to \textgreek{e}y\textsuperscript{11}-nu\textsuperscript{11}
bell horse

(Wang 1984: 19-28)

The details of both kinds of changes are set forth in Wang 1984, section 3 in a set of 33 productive tone sandhi rules, organized for presentation on the basis of historical tone category. At first glance, this long list of rules seems to reflect no particular pattern, either historical or synchronic. The complexity is significantly reduced, however, when the two tone sandhi systems are disentangled. First, there is a striking by-product of a division of Wang's list of 33 into two groups, one for West Hmongic rules and the other for Shimen rules: the former group affects only syllables with voiceless initials and the latter affects only syllables with voiced initials (as can be seen in the examples in 8 and 9 above). The significance of this discovery will be taken up in the next section. 29 of Wang's 33 productive tone sandhi rules are Shimen rules and 4 are West Hmongic rules (B1 to C1 and C1 to D1 both after A1 and after A2). When the Shimen rules are analyzed by tone values as opposed to historical tone category, the reduced list of 29 can be further reduced to 15. In 9 rules out of the 15, the second word of the complex is lowered to 31 or 11.
As mentioned above in connection with the seemingly unmotivated phonation type changes in these rules, history is still involved in the Shimen type of tone sandhi. Further proof of this is that the trigger for the Shimen changes is, in 10 out of the 15 rules, a reflex of either tone category A1 (55) or A2 (35), as in the West Hmongic system. Furthermore, an A tone trigger does not consistently lead to the lowering of the tone of the second word. The 6 Shimen rules with A tone triggers which do not involve lowering can all be analyzed synchronically as involving the spread of the final high tone to the first mora of the second syllable, as exemplified below:

$$
\begin{align*}
(10) \quad & au^{55} \quad ndzau^{35} \quad \rightarrow \quad au^{55}-ndzau^{55} \\
& \text{water} \quad \text{mouth} \\
& mgai^{35} \quad nu^{35} \quad \rightarrow \quad mgai^{35}-nu^{55} \\
& \text{meat} \quad \text{cow} \\
& tlau^{55} \quad nw^{33} \quad \rightarrow \quad tlau^{55}-nw^{53} \\
& \text{hair} \quad \text{horse} \\
& pl^{35} \quad mb^33 \quad \rightarrow \quad pl^{35}-mb^{33} \\
& \text{oil} \quad \text{fish} \\
& \text{saliva} \\
& \text{beef} \\
& \text{horsehair} \\
& \text{fish oil}
\end{align*}
$$

(Wang 1984: 19-23)

It is important to note that this is a minor pattern: all of the collocations exhibiting Shimen tone sandhi in which the first word has a reflex of tone B, C, or D, as well as some of the collocations in which the first word has a reflex of tone A, involve the lowering of the tone of the second word to 31, or 11, as exemplified in number 9 above.

To determine which of these types of tone sandhi played a role in the development of the nominal tones in categories B2, C2, and D2, we need to look at the values of the nominal tones with respect to the non-nominal tones:

$$
\begin{align*}
(11) \quad B2 & \quad \text{non-nominal} \quad 11 \quad \rightarrow \quad \text{nominal} \quad 33 \\
C2, \quad D2 & \quad \text{non-nominal} \quad 31 \quad \rightarrow \quad \text{nominal} \quad 53
\end{align*}
$$

Note that the nominal tones are higher than the non-nominal tones, from which we have determined they are derived. Of the tone sandhi systems operative in Shimen, only the minor Shimen type rules exemplified in 10 above could have produced this effect. These rules do not involve lowering as do the major rules, but seem to involve spreading, and, since the A-tone triggers are high, raising of the second syllable. I hypothesize that the tone sandhi involved in the development of the nominal tones was closer to the minor Shimen type, that is, involved spreading, and the prefix bore a high tone, causing the original (=non-nominal) tone to rise.

Further, assuming that the higher nominal tone was formed as the result of a close relationship with a high tone prefix may give us an explanation as to why the A2 tone did not split in this way: with a value of 35, it is already high -- or at least significantly higher than any of the other tones associated with syllables with voiced initials.\(^5\)

2.2.2.2. The limitation of the effects of this tone sandhi to words with voiced initials. The data presented above also allow us to propose an
explanation for the exclusion of roots with voiceless initials from the tone split according to word class which occurred in categories B2, C2, and D2.

As mentioned above, in the newer Shimen type of tone sandhi, a word or prefix alters only the tone of a following word with a voiced initial. The only rules in which words with voiceless initials are affected in Wang's list of 33 tone sandhi rules actually belong to the older sandhi system: Wang included them in his list of major tone changes since his focus in this section of his paper was on productive rules. From the examples given in Wang 1984, the only West Hmongic tone sandhi rules still operative in the modern language are those which influence words with B1 and C1 initials (the "1" of B1 and C1, again, indicates that the initial of the word with these tones are voiceless), as exemplified in 8 above. Wang's comparative study reveals only three words with voiced initials which may have been tonally altered by this older system (in each case, the triggering morpheme is gone). There is no evidence that the three West Hmongic rules in which a word with a voiced initial is affected are still productive.

What we have, then, is a split in what type of tone sandhi rule applies when. The older tone sandhi system which makes reference to historical tone categories now affects roots with voiceless initials, and the newer tone sandhi system which makes reference to the values of tones now affects roots with voiced initials. I would like to suggest that this may be due to the "permeability" (Lukas 1969) or transparency of the voiced initials, which makes either phonological union through lowering of the second syllable or spreading of the tone from the first syllable possible. What makes this plausible is that when the consonant is voiced, the consonant and adjacent vowels share a value for voicing. This may make it easier for other features to spread via an established laryngeal bridge. The roots with voiceless initials, lacking the laryngeal bridge, would thus have not been eligible for the type of tone change which led to the development of the nominal classes.

2.2.2.3. The nature of the lost prefix. The comparative evidence suggests that, if only one prefix was involved, it redundantly indicated "thinghood" on nouns and was capable of deriving nouns from other parts of speech. However, given the variety of prefixes in the modern language, it is possible that more than one prefix may have been involved. Its disappearance leads me to hypothesize that it may have been a phonologically lightweight prefix, perhaps just a single vowel. It is relevant to note in this context that Wang (1984:34) discusses the circumstances under which the prefix ʔa- may be lost in contemporary Shimen. If a classifier precedes a noun with an ʔa- prefix, he reports, the glottal stop preceding the prefix is lost. Further, if the vowel of the classifier is also a- or a1-, this prefix is entirely swallowed up. Something similar may account for the loss of our mystery nominal(izing) prefix. Finally, the tone of the prefix almost undoubtedly had a reflex of tone category A, since all of the West Hmongic tone sandhi rules require an A-tone trigger. 10 out of the 15 Shimen type rules also require an A-tone trigger, and a high tone prefix would be necessary to account for the raised tones of the nominal classes.
3. The bearing of the Shimen case on tone language typology and typological change.

Shimen Hmong is an interesting case because it appears to represent a typological change in progress. In a cyclic model for tone language type change I presented in Ratliff 1991a, the driving force behind type change is the growth and attrition of segmental morphology with concomitant word length change. Shimen has taken a significant step away from the "Asian" type and toward the "African" by taking the following series of small steps:

1. the development of prefixes from nouns;
2. the specialization of one or more prefixes as abstract nominalizers;
3. the change of root tone under influence from the prefix tone facilitated by retention of voiced stops; and
4. the loss of the phonologically degraded prefix(es) with consequent nominal class tone marking.

These changes have resulted in the presence in the modern language of an emerging set of features that are diagnostic of the "African" type: (1) presence of segmental morphology, (2) greater mean word length, (3) higher possible number of syllables (due to retention of the voicing contrast), and perhaps (4) spreading tones.  

Shimen Hmong now occupies a position between the two better-represented poles of classic "Asian" and classic "African" tone languages. In my initial study of 30 tone languages in which 12 Asian, 12 African and 6 Central American tone languages were represented, there were 11 type A ("Asian" type) languages, 16 type B ("African" type) languages, and 3 mixed (perhaps transitional) types. It is my belief that the combination of (1) relations of implication and entailment between pairs of features within the tone language feature networks and (2) communicative pressures keeps most tone languages congregated around the two poles. The three exceptions, Chin, Burmese, and Yoruba, along with the language of this study, are therefore of the greatest historical interest.

The classification of Shimen Hmong is difficult. Although there is grammatical marking of large word classes by tone, it affects less than half of the lexicon. Words remain predominantly monosyllabic and segmental morphology is marginal. Will Shimen necessarily move further toward full realization of type B (the "African" type)? Will it develop inflectional tonal morphology, for example? We would expect that only if there were signs of grammaticalization of free morphemes in the verbal phrase to mark tense or aspect or in the noun phrase to mark function or possession. Typology is only one pressure in historical change; powerful family patterns and areal pressures may keep Shimen Hmong in this intermediate position. The addition of more tone languages to the survey and the refinement of the model could show that there are many languages like Shimen which have apparently stabilized between types.
According to Wang (1985:60), even other varieties of the Northeast Yunnan subdialect, to which Shimen Hmong belongs, are not characterized by the split. For an overview of the Hmong-Mien family, see Strecker 1987.

The use of two dots under a vowel indicates breathiness, an aspect of the tone in my analysis. Wang indicates this feature as voiced aspiration, a feature of the initial consonant.

Another example is Tibeto-Burman Chin and related dialects (Henderson 1965, 1967).

Although the examples given in 8-10 involve compounds, they are relevant to our problem: prefixes change the tones of the roots to which they are attached according to both the rules of the older West Hmongic and the newer Shimen type of tone sandhi.

The fact that tone A2 (35) is affected in the productive Shimen tone sandhi changes presented in this section does not argue against this hypothesis: I am suggesting that the same type of system accounts for the values of the nominal tones, not exactly the same system.

There are two possible examples of West Hmongic A2 > C2 ("you(pl)" and the verb "to sink") and one example of West Hmongic B2 > C2 ("half(day)") mentioned in Wang 1979.

This observation can also extend to and help explain some of the minor or exceptional tone sandhi rules catalogued by Wang (1984: 40 ff), which are presumably of the Shimen type since they are not attested for other dialects. The negative verbal prefix کی - only causes tone change in the verb to which it is attached if the verb starts with a voiced consonant and the prefix کی - which nominalizes classifiers only changes the tone of classifiers which begin with a voiced consonant (see also Wang 1957: 132-35). These minor sandhi rules introduce another complication: in some cases there is right to left tone sandhi (a kind of accommodation, or leveling of differences) which operates after left to right sandhi has taken place. I agree with Wang's analysis in this regard and see no easier way to account for the forms he has recorded.

I include spreading tones as a feature of type B languages only provisionally at this point, because there are a number of type A languages, such as Shanghai, which have them as well.

They are:

A: White Hmong, Biao Min, Siamese, Bouyei, Vietnamese, Bwe Karen, Amoy Hokkien, Mandarin, Cantonese, Hakka, Xû

B: Hausa, Somali, Grebo, Mende, Kikuyu, Pakot, Turkana, Kanuri, Dinka, Kxoë, Trique, Otomi, Mazatec, Zapotec, Amuzgo, Huave

Mixed: Chin, Burmese, Yoruba

References


. 1983. "Guizhou Weining Miaoyu de Zhuangci" [Manner
words in the Miao dialect of Weining county, Guizhou Province]. YYYJ
1983 No. 2: 192-211. [Unpublished translation by Jiang Zixin.]

____________________. 1984. "Guizhou Weining Miaoyu de sheng diao" In Fu
Maoji (ed.) Zhong guo Minzu yuyan lunwenji. Chengdu: Sichuan Minzu
Minzu Chubanshe. [Tones of the Miao language of Weining, Guizhou
Province In Collection of articles on the minority languages of China.
Sichuan Minorities Publishing House.].
Xiong Lang, Xiong Joua, and Xiong Nao Leng. 1983. English-Mong English
Notes

1 According to Wang (1985:60), even other varieties of the Northeast Yunnan subdialect, to which Shimen Hmong belongs, are not characterized by the split. For an overview of the Hmong-Mien family, see Strecker 1987.

2 The use of two dots under a vowel indicates breathiness, an aspect of the tone in my analysis. Wang indicates this feature as voiced aspiration, a feature of the initial consonant.

3 Another example is Tibeto-Burman Chin and related dialects (Henderson 1965, 1967).

4 Although the examples given in 8-10 involve compounds, they are relevant to our problem: prefixes change the tones of the roots to which they are attached according to both the rules of the older West Hmongic and the newer Shimen type of tone sandhi.

5 The fact that tone A2 (35) is affected in the productive Shimen tone sandhi changes presented in this section does not argue against this hypothesis: I am suggesting that the same type of system accounts for the values of the nominal tones, not exactly the same system.

6 There are two possible examples of West Hmongic A2 > C2 ("you(pl)" and the verb "to sink") and one example of West Hmongic B2 > C2 ("half(day)"") mentioned in Wang 1979.

7 This observation can also extend to and help explain some of the minor or exceptional tone sandhi rules catalogued by Wang (1984: 40 ff), which are presumably of the Shimen type since they are not attested for other dialects. The negative verbal prefix h133 only causes tone change in the verb to which it is attached if the verb starts with a voiced consonant and the prefix ʔa- which nominalizes classifiers only changes the tone of classifiers which begin with a voiced consonant (see also Wang 1957: 132-35). These minor sandhi rules introduce another complication: in some cases there is right to left tone sandhi (a kind of accommodation, or leveling of differences) which operates after left to right sandhi has taken place. I agree with Wang’s analysis in this regard and see no easier way to account for the forms he has recorded.

8 I include spreading tones as a feature of type B languages only provisionally at this point, because there are a number of type A languages, such as Shanghai, which have them as well.

9 They are:
   A: White Hmong, Biao Min, Siamese, Bouyei, Vietnamese, Bwe Karen, Amoy Hokkien, Mandarin, Cantonese, Hakka, ʔxá
   B: Hausa, Somali, Grebo, Mende, Kikuyu, Pakot, Turkana, Kanuri, Dinka, K xo e, Trique, Otomi, Mazatec, Zapotec, Amuzgo, Huave
   Mixed: Chin, Burmese, Yoruba

References


Xiong Lang, Xiong Joua, and Xiong Nao Leng. 1983. English-Mong English
EVENT-PACKING:
THE CASE OF OBJECT INCORPORATION IN ENGLISH

Sally Rice and Gary Prideaux
University of Alberta

1. Introduction

Noun incorporation, whereby a noun stem binds morphologically to a
verb stem to which it is semantically and syntactically linked in order to
produce a derivative verb stem, is a special type of word compounding
process that has long fascinated linguists. Perhaps because NI manifests a lot
of cross-linguistic variation, it has engendered little agreement in the recent
theoretical literature, although descriptive accounts are achieving some
typological unanimity [cf. Mithun 1984; Rosen 1989]. Incorporation has been
called either a lexical or syntactic process depending on the linguist’s
theoretical predisposition [1]. Rule-based approaches to NI in English,
whether lexical like Roeper & Siegel 1978 or transformational like Lieber
1983, have held certain appeal since the general meaning of the resulting
expression is fairly recoverable from its syntactic paraphrase. This is not to
say, however, that the meaning of the resulting incorporated form is purely
compositional. Rules do make for more efficient and economical statements
given the prevalence of the phenomenon cross-linguistically and its
productivity in English [2]. However, rules fail to capture the essence of
what incorporated forms mean in English, where and when they tend to occur,
and why these compound stems rarely show up as finite verbs. Furthermore,
despite the breadth of attention paid to the phenomenon, there is no serious
discussion in the literature on English NI regarding what an incorporated form
communicates about the activity being predicated by the verb and noun stems.
Left unanswered is the crucial question: What, precisely, does an
incorporated form signal about an event that an unincorporated proposition
does not?

Our neutral but not uncontroversial position is that NI is a
morphological process with decidedly lexicosyntactic consequences. As such,
it necessarily ignores strict boundaries between lexicon and syntax (or more
accurately, it is a process that supports the view that a strict division should
not be maintained). Indeed, in English, incorporated forms freely traverse
categorial distinctions between verb, noun, and adjective. In this paper, we
examine a special case of NI, English object incorporation, with an aim to
answering two key questions concerning the distribution and ecology of
incorporated forms: (1) Why are object-incorporated verb forms, whether
conventional or innovative, most felicitous in participial or nominalized forms
and not as synthetic finite verbs as we would expect from widespread cross-
linguistic patterns? (2) Given that this is a productive process, what
synchronic and conceptual factors motivate its occurrence? Specifically, what role do lexical analogy, semantic content, speaker preference, and text or discourse coherence play in sanctioning new incorporated forms?

2. **Skewed Categorial Distribution**

Unlike the incorporation patterns found in other languages [3], most incorporated expressions in English occur as either nominalizations or participles, although they may be both. Some typical examples are presented in (1)-(3), illustrating the general categorial distribution (and relative acceptability) of stock expressions as compared to their unincorporated finite verb phrase counterparts given in (a). The (b) sentences exemplify unacceptable or marginal incorporation in finite verbs. The degree of acceptability increases for incorporated infinitival expressions (c), progressive participles (d), participial adjectives (e), gerunds (f), and agentives (g). (These categories will eventually be treated as ordered points along a noun-verb continuum.)

(1)  
- a. He lifts/lifted weights professionally.  
- b. *He weightlifts/weightlifted professionally.  
- c. ??He used to weightlift professionally.  
- d. He’s weightlifting as part of his training program.  
- e. The weightlifting competition is next.  
- f. Weightlifting is a good complement to aerobic exercise.  
- g. He’s a champion weightlifter.

(2)  
- a. She arranged flowers for the wedding.  
- b. ??She flower-arranges for weddings.  
- *She flower-arranged for the wedding.  
- c. ??She used to flower-arrange for weddings.  
- d. ?She’s flower-arranging and I’m handling refreshments.  
- e. Flower-arranging classes are now being offered.  
- f. Flower-arranging is very relaxing.  
- g. She’s a professional flower-arranger.

(3)  
- a. They moved pianos during the music festival.  
- b. *They piano-move/piano-moved during the music festival.  
- c. *They used to piano-move during the music festival.  
- d. ?They’re piano-moving during the music festival.  
- e. The piano-moving company was hired during the festival.  
- f. Piano-moving is hard work.  
- g. The piano-movers were well paid.
Note the distribution of acceptable incorporations away from finite and infinitival verb forms towards participial constructions and nominalizations. This clustering no doubt inspires the prevalent tendency to characterize English object incorporation as a nominal compounding process. Nevertheless, this pull away from finite verb forms remains a mystery that has thus far failed to draw attention or promote a satisfactory explanation. Before we propose a solution to this distribution paradox, let us first catalogue a small selection of conventional incorporated forms in English, followed by examples of attested innovative forms which, for the most part, have yet to achieve full lexical sanction.

2.1 Fixed Expressions

There are hundreds of stock incorporated expressions in English. These range from the semantically transparent and productive to the figurative and non-productive. Even among conventional expressions, the compound stems tend to fall out at the nominal end of the continuum, that is, as nominalizations. Of course, this small sampling does not adequately reflect the sheer numbers of nominalizations compared to participial forms. Only a handful of forms exist as transitive finite verbs. Most of these result from backformation, and, in all cases, the incorporated object serves a classifier function vis-à-vis the independent direct object [cf. Rosen 1989] as in (4) or it stands, as a body part, in a part/whole relation to the independent object as in (5) [cf. Mithun 1984’s Type II NJ]:

(4) a. They babysat/hero-worshipped/kidnapped the prodigy.  
b. They giftwrapped the toy.  
(5) They fingerprinted/browbeat/brainwashed the suspect.

Furthermore, those incorporated forms that function as finite intransitive verbs are usually defective on several counts. For example, the compound verb stems may fail to sustain past tense inflection, as shown in (6); the resulting compound may be obsolescent or the result of a backformation and so the verb stems may not readily engender new formations, despite their potential name-worthiness as well established or habitual activities, as in (7); in addition, the compound stem may only support a figurative (and therefore unpredictable and unproductive) interpretation, as in (8).

(6) a. He bullfights/*bullfought for a living.  
b. He lipreads because he can’t afford a hearing aid.  
   He *lipread before he got the new hearing aid.  
c. Next Tuesday, they’ll sightsee.  
   Last Tuesday, they *sightsaw.
a. He bartends/*sheep tends for a living.
b. He beachcombs/*mapcombs every morning before work.
c. He stagemanages/?stable-manages the company.

(8) He backbites/chainsmokes/namedrops/nitpicks more than most.

Mithun's 1984 implicational hierarchy underlying the historical development and decay of her four types of NI cross-linguistically allows for decreased or arrested productivity at particular stages. It is unclear whether or not languages might lose productivity for various forms associated with NI rather than suffer inhibition or loss at various functional stages in the hierarchy, but this seems to be the case in English. Finite verb forms, especially when inflected for past tense, are unproductive despite the unitary or widely recognized activity being predicated by the verb and noun stems. This role of specifying name-worthy or institutionalized activities is maintained by partcipial and other deverbal forms in English despite the fact that the verbal template is unproductive.

Progressive participles are slightly less restrictive than finite verb forms among both stock incorporated expressions and innovative ones. In fact, incorporated verbs sound much better as progressive participles than as finite verbs (9). Some stock agitative forms, through backformation, are permissible as progressive participles (10).

(9) They were sightseeing/bartending/panhandling when we saw them.
(10) He's cheerleading/deerhunting/gunrunning regularly now.

Many lexicalized incorporated forms exist conventionally as participial adjectives:

(11) a. We had a bloodcurdling/hair-raising/nerve-shattering experience.
b. The cost-cutting/money-saving measures are also seen as time- wasting/time-consuming ones.
c. They cater to a flag-waving/gun-toting/banjo-playing crowd.
d. This record-breaking cold spell is causing heart-breaking losses in the agricultural community.
e. It's a new and dangerous cancer-causing agent.

Because participial forms are especially productive, lexicalized instrumentals like screwdriver, as in (12), and agentives like shopkeeper, as in (13), freely license corresponding participial adjective forms:

(12) For all your carpetsweeping/fishfinding/flyswatting/nutcracking/ painrelieving/toothbrushing/typing needs!
(13) a. He's a bandleading/clockwatching/dogcatching/gluesniffing/purse-snatching/stamp-collecting fool!
   b. I'm afraid his chimneysweeping/drug-pushing/moneylaundering/pallbearing/storytelling days are over.

By far, the most prevalent of the lexicalized incorporated forms occur as nominalizations, either exclusively or primarily so. These range from gerunds given in (14), to instrumentals of a diverse sort in (15), to agentives in (16). Of the three types, the latter is the most common, although not necessarily the most productive:

(14) a. Bedwetting and thumbsucking are habits he'll outgrow.
   b. Cardplaying and problem-solving require more luck than skill.
   c. Broadcasting/bloodletting has been outlawed.
   d. A good housecleaning/homecoming/housewarming would be nice.

(15) a. What you need is a good eggtimer/lawnmower/dishwasher/pancake-turner/clothesdryer/viewfinder.
   b. That movie was a blockbuster/eyeopener/mindblower/crowd-pleaser.

(16) a. He's a well-known fundraiser/homeowner/officeholder/safecracker/scriptwriter/shoemaker/woodcutter.
   b. What a(n) asskisser/cockteaser/motherfucker/tushlicker!

2.2 Attested Innovative Expressions

Novel incorporated forms are constantly being created in English -- some on the basis of established lexical patterns like those exemplified in 2.1, others on the fly for various pragmatic effects. These motivating factors will be discussed in greater detail later. It should be noted that we have not found any spontaneous innovations that are finite verbs, infinitivals, or progressive participles. A few are listed in Hall 1956. However, it is quite consonant with the meaning associated with object incorporation that the distribution should tend away from these types of expressions, whatever the historical precedence. The analysis that follows explicitly addresses these distribution peculiarities. A small sampling of attested innovative forms in their discourse or textual contexts follows for progressive participles (17), participial adjectives (18), gerunds (19), and agentives (20):
(17)  
a. As on previous Christmas Eves, they'll be **carol-singing** for appreciative audiences. [Hall 1956]  
b. She and her father's employees are now **haycutting**. [Hall 1956]  

(18)  
a. The Patriot is considered the best **target-finding** missile in the Allied arsenal. [CNN broadcast]  
b. In the Soviet Union, poets and soldiers join together in the fields to pick potatoes. In fact, no one is exempt from such **potato-picking** efforts, because there's always the fear of imprisonment if you refuse. [Bruce Derwing, personal communication]  

(19)  
a. Dogs are better than cats for certain things like **foot-warming**. [radio talkshow]  
b. His hands have stiffened from years of **grass-cutting** and **snow-shoveling**. [personal communication]  

(20)  
a. They sent ballots to a national sampling of 20,000 **record-buyers** to select the music award winners. [TV broadcast]  
b. **Game-developers** P. Rowles and D. Brown are shown putting the pieces of their award-winning board game/jigsaw puzzle together. [Caption under photo in magazine]  

Based on the examples we have presented so far, it is quite easy to generate possible forms, especially agentives. For example, all the following are probably acceptable for most speakers: **grammar-writer**, **sentence-parser**, **theory-monger**, **gravy-stirrer**, **channel-flipper**, **tofu-eater**. While we have yet to address what object incorporation means and does in English, which noun and verb stems foster incorporation, or what licensing factors we exploit under different conditions to create novel forms, it is not difficult to explain why certain forms are ruled out.

### 2.3 Unattested and Unlikely Expressions

The following are unacceptable for the speakers we consulted:

(21)  
a. I've got to **houseclean up** today.  
b. They are always **money-giving** to charity.  

(22)  
a. She's **voice-hearing** again.  
b. The **French-knowing** public voted for Quebec sovereignty.
(23) a. The *mile-runners had to drop out of the marathon.
b. The *hour-lasting newscast was preempted by hockey.

(24) a. *Movie-leavers always disturb the audience.
b. They *room-entered through the side-door.

(25) a. They won’t stop *singing.
b. They are *life-living to the fullest.

(26) a. He’s a professional animal-trainer/*mammal-trainer.
b. He’s a born dog-lover/*poodle-lover.

With the exception of the incorporated stems given in (21), the forms in (22)-
(26) can be ruled out on the basis of low transitivity properties discussed in
Rice 1987 (especially Chapter 5), even though the corresponding
unincorporated proposition is syntactically transitive. The forms in (21)
involve either a complex verb stem as in the verb-particle construction in (a)
or a complex complement structure as in the dative verb stem in (b). We will
not speculate here why these verb stems inhibit incorporation. As for the
other forms, they manifest low transitivity because they involve internal
and/or inherently imperfective mental events as in (22); metric expressions
rather than real patients as in (23); absolute motion of a single entity in space
as in (24); cognate objects as in (25) (although gift-giving is a notable
exception); and direct objects that are either superordinate or subordinate and
not basic level category words as in (26). Paradoxically, although object
incorporation signals low transitivity (cf. Hopper & Thompson 1980), a certain
degree of affectedness, independence, and specificity must be predicated of
the noun stem as a potential direct object in order to license incorporation.
Incorporated objects are characteristically indefinite and nonreferential, but
the underlying action must be construed as sufficiently dynamic, effective, and
directed towards a good direct object or else incorporation is disfavored.

3. The Analysis and the Hypothesis

Clearly, the process of object incorporation in English, like its
morphosyntactic relative, nominalization, is neither chaotic nor idiosyncratic.
It is, however, complex. Discernible patterns do emerge, but they vary in
their productivity and their semantic predictability [4]. Rule-based analyses
have been vague about how novel forms are added to the "lexical core" or
"invented in some appropriate context and come into general use" [Roeper &
Siegel 1987:200]. They either relegate the phenomenon to a disjoint listing
in the lexicon or they subject all instances to the same homogenizing rules.
What is most interesting about object incorporation is its resistance to simple
analysis. There is, nevertheless, a unifying schema shared by most object
incorporated (de)verbals in English. They all predicate a type interpretation
of some transitive event. Some incorporated forms simply name the activity
without reference to a specific episode or specific participants. Others may attribute this activity to some agent who is not actually engaged in the activity, but who may be habitually or figuratively associated with it.

3.1 What Incorporated Expressions Mean

As a morphosyntactic process, object incorporation, like certain antipassive constructions in ergative languages, performs almost the inverse function of passive. Whereas passive heightens the prominence of the direct object, object incorporation diminishes it. It is a process whereby the direct object not only loses it separate morphological placement and status, but it loses its semantic integrity as well. When incorporated, a noun is never modified or inflected and, most importantly, generally lacks reference to any particular entity. Instead, the noun designates a general type, although in some pragmatically induced cases, a specific referent is recoverable from context. Incorporation guarantees, in effect, that the noun will have something akin to a mass or type interpretation, as it does in other non-head positions (i.e. as the first stem in a nominal compound or when used as a nominal adjective). The intriguing question is why, in case after case, a non-referring, nonspecific incorporated object weakens its incorporating verb causing the verb to incorporate semantically, as it were, with some agent or instrument habitually associated with the action or with other nonspecific and nominalized episodes of that event. An incorporated form resulting from a verb and its incorporated object has essentially been "depropositionalized." It lacks the truth conditions of its corresponding syntactic paraphrase. It may have the meaning of several episodes of the stated activity compressed into one compact expression. As such, a high degree of detail has been lost. Individual tokens are subsumed by a type expression. The incorporated form is but a schematic representation of a generic activity, stated in such a way as to underscore a sense of habitualness and non-uniqueness.

3.2 A Cognitive Grammar Analysis

Both the meaning of incorporated forms and their skewed categorial distribution are directly addressed from the theoretical perspective of Cognitive Grammar (Langacker 1987a and to appear). Moreover, the distribution facts are shown to follow from the meaning. First of all, this framework has a natural way of accounting for the interaction of nominal reference and verbal aspect, which we propose is at the heart of the object incorporation phenomenon. Secondly, CG notes that objective content alone does not inform the meaning of a predication. There is a set of construal parameters that the speaker can impose on a scene that may have dramatic linguistic consequences. Conceptualization factors, especially those involving
alternate profiling of the same objective content, are responsible for the
categorial distinctions linguists impose on like predications. Consequently,
traditional categorial distinctions in grammar (such as noun/verb) are viewed
non-categorically -- as points along the same continuum. Moreover, the
different categories may actually share most conceptual properties.

Most significantly, Langacker 1987b notes a certain parallelism between
a mass or type interpretation for nouns and an imperfective interpretation for
verbs. Briefly, they each involve the suspension of both boundedness (e.g., in
a spatial or temporal domain) and sequential scanning in order to force a
change in construal. In the case of nouns, the entity is conceived not as an
individual (perhaps replicated) instance, but as an indefinitely expandible,
homogenous region in conceptual space. With verbs, the event is conceived
not as a single episode that unfolds and ends, but as an ongoing activity
construed as an unchanging, unbounded series of states in conceptual space.

Many purported categorial distinctions reduce to differences in
profiling against the same base, that is, differences in how the same objective
content is construed. This means that noun and verb stems may share the
same schematic meaning. This is especially clear with stems that can be either (like blink, stop, hit, or broadcast), but differences between verbs and
their related nominalizations can work the same way (such as explode/explosion, destroy/destruction, or perform/performance). It is only
through modification and inflection that conceived differences are imposed or
detected. These are the differences that have grammatical consequences by
forcing changes in mental imaging.

Langacker 1987b and Langacker to appear (especially Chap. 1) classify
finite verb forms as relational processes having a temporal profile. All other
verbal derivatives, such as infinitives, participles, and nominalizations, are
considered to be atemporal relations, lacking grounding in a spatio-temporal
domain. Not so curiously, it is precisely the atemporal relations which stand
as the most productive categorial templates for incorporated forms. Because
incorporated forms tend to convey an activity type rather than predicate a
specific instance of some event, temporality is fundamentally at odds with the
meaning associated with English object incorporation. More specifically,
nominalizations differ from finite and non-finite verbs in other important
ways. For example, a nominalization shifts the profile of a verb to some
nominal entity evoked as part of its inherent structure. The profiled entity is
most commonly the verb stem's subject or trajector (TR) in Cognitive
Grammar terminology. An agentive nominalization profiles the TR of the
underlying predication, although a schematic version of the verb and the
direct object or landmark (LM), in cases in which the verb is transitive, may
be present as well. In agentive nominalizations involving incorporated verb
stems, the underlying verb and the LM are both schematically present
although they are usually non-referential.
Unmodified noun stems in English represent indeterminate types of the entity specified by the noun. Singular and plural instances require a determiner or inflectional plural marking, respectively. It is therefore not surprising that incorporation involves a type-specifying noun stem (as in 27a) and not a modified or plural noun (as in 27b-c).

(27)  
   a. John’s a **lion-tamer.  
   b. John’s a *fat lion-tamer [John tames fat lions].  
   c. John’s a *lions-tamer.

Likewise, verbal inflection is incompatible with the inherent meaning associated with an incorporated form. A synthetic verb stem invokes an activity type without reference to a specific episode or specific participants. Therefore, incorporating verb stems resist receiving a specifying temporal profile (through tense inflection) as indicated by (28a-b). Participial markers (-ing) and nominalizers (-er) explicitly lack a temporal profile which may explain why only forms with this morphology tend to engender felicitous incorporations (28d-f).

(28)  
   a. He ??lion-tames in the circus.  
   b. He ??lion-tamed before he lost his hand.  
   c. He wants ??to lion-tame when he grows up.  
   d. The lion-taming clown is a former trapeze artist.  
   e. His lion-taming is so artistically done.  
   f. He’s a lion-tamer in the circus.

In sum, the distribution facts of object incorporation underscore a certain iconicity between loss of lexical independence and loss of conceptual uniqueness. Since one participant in the event is non-referential and the activity itself is unanchored to any specific instance, the morphosyntax used to specify nouns and to inflect verbs for finite actions should be inconsistent with the meaning of the noun-verb incorporation. The distribution facts bear this out. Furthermore, as an ungrounded and schematic type predication, the construction should easily sustain metaphorical or figurative interpretations. We address this point next.

3.3 Motivating Factors

Although object incorporation is a morphologically possible and fully productive device in English, its use is rather limited. As Mithun 1986:33 has clearly stated, "incorporation is not an arbitrary formal alternative to a syntactic paraphrase; rather, the different structures serve different functions." A host of factors emerge that increase the likelihood of an acceptable
innovative incorporation over a corresponding propositional form. Their influence is probabilistic at best. The relative contribution of each of these factors remains to be determined and is the focus of on-going psycholinguistic research at the University of Alberta. The best delineated are:

**Analogy:** Analogous patterning with well-established forms in the lexicon cannot be underestimated as a powerful factor underlying the creation of innovative forms. (In some instances, lexical analogy reduces to a preference for specific mono- or bi-syllabic Old English stems. The following verbal stems are especially productive: -keeping (diary-keeping, tally-keeping); -taking (turn-taking, hostage-taking, leave-taking); -making (trouble-making, candy-making, snow-making); -speaking (Inuktitut-speaking, nonsense-speaking); -buster (Scud-buster, morale-buster, pricebuster.)

(29) "More and more people are telling me how much they dislike the mean-spirited material -- the ethnic-bashing, the women-bashing, the gay-bashing." [comedian Jay Leno]

(30) Now that surrogacy is becoming more and more prevalent, be prepared for more incidences of zygote-napping as surrogate mothers undergo a change of heart. [*NY Times*]

Analogy with semantically-related concepts is also productive:

(31) Not that there is any shortage of child-molesters, child-starvers, child-bombers, child-drowners, child-whippers, child-beaters, or child-burners on the planet! Just turn on the TV! [letter to the editor, *Edmonton Journal*]

**Newspaper-speak:** The compactibility of the incorporated predication and the fact-establishing function of the predication as invoking a type or role make it especially appealing to newspapers or media in which information must be communicated succinctly.

(32) The hobo convention had come to order to talk about the freedom, the utter and illicit joy of stealing a ride on a freight train. However, these weren't ordinary hobos, these were a new breed of railriders -- the weekend adventurer, the yuppie 'bo. [*Dallas Morning News*]

(33) A scientist at Texas A&M University has devised a technique for using radar for locating buried bodies, notably those of murder victims. For his body-hunting method, Dr. Robert Unterberger adopted a technique commonly used by geophysicists: A special form of radio emission called ground-probing radar was used in the tests he conducted.
In the radar’s corpse-finding adaptation, the radar echoes are affected by changes in the electrical conductivity of air in the soil. [Associated Press]

Text/Discourse Cohesion: An incorporated form is sanctioned by previously established or inferrable syntactic paraphrases and provides a short-hand reference back to the original predication.

(34) The best way to guarantee a good Christmas tree is to cut one yourself. A $2 permit can be obtained at the forestry office. For more information and the location of tree-cutting spots by calling 427-3554. [govt. brochure]

(35) In a recent issue of the Journal of the American Medical Association, doctors have published yet another article about the medical source of Vincent Van Gogh’s artistic genius. The latest debate over the painter’s ailments is just one example of an ongoing exercise that certain aesthetically minded doctors engage in. They call it "Diagnosing the Canvas." However, most art-loving doctors say they engage in canvas-diagnosing less for scientific reasons than because it is an irresistible pastime. [Edmonton Journal]

Metaphorical or Figurative Value: Because incorporated forms only invoke a schematic version of the stated activity, they easily get extended semantically. Incorporated forms are often used to convey a metaphorical or at least less-than-literal sense when the full, unincorporated proposition does not permit such an interpretation.

(36) Fetus-farming (*farming fetuses/*the farming of fetuses); Prepare to hear this terrible phrase as Canadians grapple with a new twist in the abortion dilemma. [CBC broadcast]

(37) The government official announced that his inquiry would not go into Quebec "like a bull in a china shop." Since he didn’t promise to avoid china-smashing behavior (*behavior like smashing china) in other provinces, this apparently meant that Quebec would be treated with special care. [Edmonton Journal]

(38) I can read you like a book, but you’re not exactly a page-turner (??you don’t exactly turn pages).

Metalinguistic or "Cleverness" Value: An incorporated form often carries humorous connotations that are lacking in a syntactic paraphrase, no doubt because incorporations easily support figurative interpretations.
(39) From *The Manticore* by Robertson Davies:
--"So you suggest I bite the bullet and go on."
--"Go on, certainly. But let us have no bullet-biting. I think you have bitten too many bullets recently."

(40) Even Geraldo Rivera is apparently embarrassed by Geraldo Rivera. But you'd think after all these years of nose-busting, vault-opening, Satan-seeking stunts, he'd be immune to any embarrassment. [TV commentator]

(41) He needs someone to hold his spotlight and, unfortunately, he knows that I'm real good at spotlight-holding.

**Speaker/Author Preference:** Novel forms may be invented or avoided due to speaker or author preference or aversion. Some authors (James Joyce being a celebrated example) use them extensively.

(42) (From *Fifth Business* by Robertson Davies, a story about a hagiologist): This was the first of my annual journeys, broken only by the 1939-1945 war, saint-hunting, saint-identifying, and saint-describing.

### 3.4 Constraining Factors

Some of the factors which inhibit the occurrence of an incorporated form were listed in Section 2.3. In this section we briefly discuss a few others. Multisyllabic stems and non-basic level category words may resist incorporating. However, the biggest constraining factor is probably low transitivity. It is very ironic that the corresponding propositional form must manifest high transitivity since the incorporated form signals low transitivity. For example, from the highly transitive "He killed his dog" one could logically conclude that "He's a dog-killer," but from the inherently imperfective and low transitive "He missed/neglects his dog," one doesn't get "He's a *dog-misser/??dog-neglecter." High transitivity makes for a name-worthy event. Furthermore, it is often the salience of the event that influences the number of token occurrences necessary to render a type reading. For example, one could say "He once killed a dog, so now he's a dog-killer" but not, "He once bathed a dog, so now he's a *dog-bather." Sometimes, however, many repetitions are not necessary. If an event is construed as highly salient for whatever reason, a single episode can mark a type, as in the dog-killer example above or as in "I saw him take a sip so he must be a vodka-drinker." Of course, many of these factors, whether motivating or constraining, may be at play at once. The effects of each are subtle and, as we have found, are difficult to control for in an experimental situation.
3.5 An Hypothesis about Their Occurrence

Mithun 1984 provided the most compelling and succinct hypothesis relevant to the presence and occurrence of innovative incorporated forms of the type prevalent in English: "to background known or incidental information within portions of discourse" (p. 859). This hypothesis was also present in a more general form in Hopper & Thompson 1980 in which they suggested that highly transitive constructions are used as a discourse-based foregrounding strategy while constructions exhibiting low transitivity instead signal some sort of backgrounding function which usually correlates with given information. Because linguistic packaging is also likely to be more dense (as in a nominalization or incorporated form) with given information, we, too, have hypothesized that object incorporation has, among other purposes, a discourse function as a backgrounding device. As a compact construction signalling low transitivity, incorporation should therefore correlate with given and backgrounded information. Furthermore, an incorporated form might help achieve certain textual or discourse coherence especially in those cases in which repeating the full proposition would individuate the activity too much for the speaker's purpose or otherwise be stylistically cumbersome. Of course, many incorporated forms have become lexicalized and are so well entrenched in the language that their distribution may be impervious to discourse effects. But novel incorporations might be more susceptible to information flow and density considerations. We therefore hypothesized that nominals and attributives consisting of innovative object-verb compounds should bear more of the responsibility for conveying given information than unincorporated paraphrases. The latter should be preferentially utilized when the event must retain its specificity for the purposes of conveying something new, unique, or particularly effective about the event or its participants.

4. Preliminary Experimental Evidence

To test this hypothesis, a series of experimental studies is underway that places novel incorporated forms in different discourse contexts. One experiment has already been run which investigated the naturalness for subjects of incorporated versus non-incorporated forms (i) when introducing new information within a paragraph and (ii) as part of given or background information in a paragraph.

Our results thus far have been somewhat inconclusive with respect to these data. In short, the hypothesis wasn't borne out. This first experiment only controlled for information flow and so unforeseen lexical effects may be muddying the results. The only significant effect was on the subjects, indicating one of two things: The phenomenon (information-packaging effects on incorporation) is weak and we need a finer detection mechanism or we
have underestimated the effects of lexical analogy, the variety of semantic factors that influence the meaning of the resulting expression, and the many pragmatic factors that facilitate its use. An item analysis performed on the stimulus forms suggests this to be the case. We have yet to perform cluster analyses on the subjects to determine whether there may be an underlying systematicity guiding subjects’ responses. Some subjects refused to accept any incorporated form, while others accepted them regardless of their textual environment. Innovative incorporations may overwhelmingly be the product of high metalinguistic awareness, a conclusion that would explain the prevalence of these forms in newspapers and in literary texts in which a premium is placed on linguistic compactibility and creativity. This conclusion is certainly consonant with Mithun’s observation that "[i]ncorporation as a stylistic device is notoriously fragile -- in unpredictable ways" [1986:33].

Successive experiments are now being undertaken that are more sensitive to the variety of lexical effects and the inter-subject variability we observed in the preliminary study. These empirical results will add to our understanding of the phenomenon showing it to satisfy diverse conditioning factors simultaneously. Obviously, no one factor alone determines the choice or naturalness of a spontaneous yet evanescent incorporated form. Object incorporation, as a less than fully grammaticized morphosyntactic phenomenon, remains as fascinating as ever, but only slightly less mysterious.

NOTES

[1] Lees 1963 reduces most English compounding of this sort to a very general transformational rule affecting deverbal nominalizations. For Roeper & Siegel 1978, incorporation is instead expressed as a lexical transformation creating synthetic compounds from a verb and one of its "first sisters". According to Lieber 1983, Saddock 1986, and Baker 1988, however, incorporation is a syntactic operation that is responsive to but must maintain certain thematic roles and Case assignments governed by the verb.
[2] Cf. Marchand 1960 for a descriptive account. Beyond the analytical flip-flopping, English noun incorporation has alternatively been dismissed as an unproductive type of lexical compounding [Mardirussian 1975] or hailed as neither "rare nor meaningless" [Hall 1956]. The descriptive and theoretical consensus is that it is productive. We believe that its productivity is limited beyond certain literary genres and certain speakers.
[3] Cf. Mithun 1984 and Rosen 1989. With reference to the former, English noun incorporation seems to manifest properties associated with her Types I-IV, although she dismisses NI in English to be a special (and rare) kind of

REFERENCES


Mixers, Mufflers and Mousers: The Extending of the -Er Suffix as a Case of Prototype Reanalysis

Mary Ellen Ryder
Boise State University

One of the more productive derivational processes in present-day English is the -er suffix, which is used to produce a wide variety of nominals, a very small sample of which is given in (1):

(1) **inputter:** someone who inputs data to a computer
**muffler:** part of a car that muffles sound
**thriller:** movie that thrills the audience
**mudder:** horse that runs well in the mud
**blue-hairer:** low-risk investment suitable for "blue-hairs", i.e. little old ladies with blue hair

(See Ryder 1991 for a more complete list of types of -er nominals.) While this suffix has evidently been fairly common throughout the history of English, its range of uses was much narrower during the Old English period, when -er forms almost exclusively denoted human agents, and were based predominantly on verbs describing the action of the agent (Kastovsky 1971), as in (2):

(2) **bæcere:** baker
**fullere:** fuller
**steorere:** steersman
**writere:** writer

Purely syntactic treatments of -er forms have been proposed (e.g. Levin and Rappaport 1988), but in addition to their failure to account for the complete range of present data, none of them provides motivations for the expansion in the use of these expressions since the Old English period.

In this paper, I propose a model that characterizes -er forms in terms of semantic case, event structure and prototype reanalysis. I claim that many of the present types of -er forms derive from a single prototype agentive form:

(3) **Agentive prototype:** an -er form refers to someone who is the agent in a highly transitive event (Hopper and Thompson 1980, Langacker in press) represented by the verb on which the form is based.

Fillmore (1977) and Langacker (in press) among others have pointed out that attempts to set up case descriptions based on a finite number of cases, each having a set of absolute characteristics, have met with a number...
of serious problems. One piece of evidence for this is the variation in both
the number of different cases proposed and the characteristics given for each
case by different linguists (Dillon 1977). Even for the notion of "agent",
which is one of the more agreed-upon cases, some (e.g. Jackendoff 1972)
consider intentionality to be definitional, while others (e.g. Chafe 1970) define
agents as self-energy sources. So for Jackendoff, the subject of (4a) would be
an agent, but that of (4b) would not, while Chafe would consider both subjects
to be agents:

(4)  a. John punched George.
    b. The wind blew the table over.

An examination of different treatments of case shows a general, if not
complete, agreement on some characteristics, with decreasing agreement on
others. Such a pattern suggests that the different semantic cases are better
viewed as prototypes rather than as absolute categories. While some event
participants will be considered agents by everyone, other, less prototypical
ones will be considered agents to the extent that they can be construed as
matching or approximating the prototype (Langacker 1987).

Semantic cases are defined in relation to an event. Our observation
of the world consists of the perception of a series of temporally contiguous
events, which I will refer to as an event-chain. We group different subsets of
an event-chain together to form a unit I call an episode. Although there is a
certain amount of natural clustering among events in a chain, what is
construed as an episode can vary greatly. To a quarterback, an entire game
could be perceived as an episode; to a neurobiologist, an episode could be the
firing of a single neuron. The prototypes for semantic cases have been based
on roles played by participants in what I will call a basic-level episode, on
analogies with Rosch’s basic-level categories (Rosch 1978). The sentence in (5)
describes such a basic-level episode, involving an agent, instrument, and
patient:

(5)  Hubert carefully smashed the plate with a mallet.

This type of episode is centered around a fairly brief, continuous, and highly
visible action. The agent is a person who volitionally performs the action.
The instrument he uses is an inanimate, non-self-moving object. The agent
and the instrument simultaneously participate in the action, which creates a
radical change of state in the patient, a concrete, inanimate, non-volitional
object. Because the event is centered on a continuous action, its boundaries
can be fairly clearly defined. From this basic-level episode, we can factor out
the characteristics that a prototypical agent will have, which are given in (6):
(6) Description of a prototypical agent:
1) volitional
2) self-moving
3) concrete
4) entity
5) producing a discernible change in
6) a concrete entity (patient)
7) by means of a discernible action with definable boundaries

However, just as some birds are more birdish than others, so events and their corresponding case roles in the real world match the prototype of a basic level episode in varying degrees. Some of the differences are due to aspects of the real world. Some actions are more rapid, more visible or more continuous than others. Some produce greater or lesser changes in their recipients. The elements initiating the event have varying degrees of volition and intrinsic energy.

The other major source of differences between events is the observer’s point of view. How fine-grained is his analysis of a series of events? While the sentence in (5) is most often viewed as a single episode, it can easily be broken down into an event-chain, each unit of which will have much narrower boundaries. Such a chain is given in (7):

(7)

<table>
<thead>
<tr>
<th>simultaneous actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbert swung his arms (gripping the mallet)</td>
</tr>
<tr>
<td>The mallet moved through the air</td>
</tr>
</tbody>
</table>

\/

\/

\/

\/

|| the mallet struck the plate |

At the level of detail given in (7), it is possible to construe causation as a relationship between two events, rather than between a person and a single action. This is the interpretation of causation used in Dowty’s (1979) analysis of verbs discussed in Foley and van Valin (1984). The existence of these two possible construals of causation based on different episode structures probably contributes to the tendency noted by Lyons (1977) "to identify causality with agency."
We can use a much coarser-grained analysis on the event described in (5) by expanding the boundaries of what is considered to be a single episode. Suppose Hubert is a professional plate-smasher. He might view his whole day’s routine, including readying himself, driving to work, repeated plate-smashing, driving home, and changing clothes as a single episode, encoded as:

(8) I went to work today.

In this case, all the actions encoded in (5) constitute one sub-component of the single episode encoded in (8).

Within each episode, however it is defined, a person’s perspective may change based on which elements of the episode are in focus, or foregrounded. The episode described in (5) certainly involved a number of elements not mentioned in the sentence, including whatever the plate was resting on and other items in the room such as windows or wall-clocks. What is foregrounded depends in part on the characteristics of the event’s elements; some qualities are intrinsically more salient than others. All other things being equal, human beings are more salient than animals, which are more salient than concrete objects (Langacker in press). It is because of this that the agent in a prototypical basic-level episode is generally viewed as the causer rather than the instrument, even though both of them participate fairly equally in the action. Elements that are moving or experiencing obvious changes of state are more salient than those that are not (Fillmore 1977). The three elements encoded in sentence (5) all exhibit one or more of these naturally salient characteristics. The agent, Hubert, is both a human being and a moving object. The instrument, the mallet, is inanimate but moving. The patient, the plate, is undergoing a drastic change of state which probably also involves movement. Most of the other objects likely to be in the room will have few if any of these characteristics.

However, as anyone who has ever stood before an inattentive audience knows, people are quite capable of ignoring the naturally more salient elements in a scene, and foregrounding virtually anything. For example, the episode described in (5) could have been perceived and encoded as:

(9) The clock face, obscured briefly by some moving object, indicated two minutes until quitting time.

As a result of these sources of variation in the real world and in the viewer’s perspective, many elements will have some but not all the qualities found in the agents of prototypical events. In determining which episode participants can be described using the originally agentive -er forms, I suggest that speakers have constructed different episode structures, and then
reanalyzed the structure of -er forms accordingly. This claim is summarized in (10):

(10) Extensions to other referent types found in modern -er forms are the result of shifts in construal of the defining episode, with resultant changes in the importance of each of the characteristics of the referents of originally agentive -er forms.

In this paper, I will support these claims using evidence from instrument Er’s, event Er’s and patient Er’s.

Prototypical instruments share with prototypical agents the characteristic of producing a discernible change in a concrete object, although they contrast in volitionality and often in self-movement as well. Moreover, if we consider the finer-grained analysis of a basic-level episode, as in (7), we see that the action of the prototypical instrument overlaps significantly in time and in form with that of the agent. One way in which episodes become less prototypical is for the actions of the agent and instrument to become more temporally separated and less similar in form of movement, until they are more easily construed as comprising two episodes rather than one. This is exemplified in the actions encoded in the sentences in (11):

(11) a) John struck the wall with the bat. (agent and instrument actions simultaneous and overlapping in type of movement)
    b) John drilled a hole in the wall with his power drill. (agent and instrument actions simultaneous but distinct in type of movement)
    c) John shot a hole in the wall with his rifle. (agent and instrument actions in close sequence and distinct in type of movement)
    d) John blew up the wall with a time bomb. (agent and instrument actions separated in time and distinct in movement)

As participants in an action, instruments are intrinsically less salient than human beings, being inanimate. However, even in the basic-level prototype, they have a more direct effect on the patient than does the agent. As the agent and instrument become more separated from each other in time, and the instrument’s action becomes increasingly independent of the agent, the agent’s action may be construed as outside the episode, leaving the instrument as the most agent-like participant remaining. Even in the prototypical case, it is possible for a perceiver to narrow the boundaries of the episode to include only the instrument-action-patient portion of the event chain (Langacker in press), again promoting the instrument to a more agent-like position as the immediate causer of the action and the only actor in the
episode. Grammatical evidence that agents and instruments are indeed construed as highly similar comes from the use of with (prototypically an instrument marker) and by (prototypically an agent marker) in both Early Modern and Present-Day English:

(12) Early Modern: a) Like to a ship...boarded with a pirate.
b) Exit, pursued with a bear.

Modern: a) George hit it with/*by a hammer. (agent within the episode)
b) He was struck by a hammer. (agent outside the episode)

It is the shift of the agent to outside the boundaries of the episode that motivates the extension of agentive -er forms to include instrument Er's. Kastovsky (1971) cites only three instrument Er's in Old English:

(13) wisere: signpost (wisian = to point the way, direct)
sceawere: mirror (sceawian = to look at, see, inspect)
punere: pestle (punian = to pound)

A sampling of instrument Er's show citations in the Oxford English Dictionary almost entirely from the 1500's through the 1800's:

(14) atomizer 1875 plungers 1777
bailer 1883 poker 1534
borer 1572 scraper 1552
clipper 1578 (back)scratcher 1835
grinder 1688 (candle)snuffer 1552
knocker 1598 toaster (toasting 1695
lighter 1487 fork
peeler 1883 washer 1808

This was a period of great proliferation in implements and machines whose movements were increasingly differentiated from that of their human operators. However, while the use of instrument Er's may have been motivated originally by this increase in agent-like machines and tools, once people began to use these forms for some instruments, even non-prototypical ones, the -er expression was reanalyzed to include any instrument, including quite prototypical ones. A sampling of modern instrument Er's is given in (15), in order of increasing prototypicality as instruments:
(15) Self-moving instruments, agent absent: dishwasher, (clothes) washer, drier, sprinkler, record player, computer, timer  
Self-moving instruments, agent present: (power) screwdriver, (power) stapler, can opener, lawn mower, vacuum cleaner  
Non-self-moving instruments that diverge from their agent in time or form of movement: bird feeder, egg timer (hour-glass type)  
Non-self-moving instruments overlapping in time and form of movement with their agents: screwdriver, stapler, grinder, plunger, clippers, cleaver, peeler, butter curler, potato masher, grater

Once the pattern for -er forms had been reanalyzed to include instruments as referents, a second episode restructuring produced another extension. Returning to Hubert, the professional plate-smasher, I proposed earlier that he may see his whole daily routine as a single, fairly routinized episode. Suppose Hubert not only uses a particular kind of mallet for smashing, but also wears a special type of clothing that is designed to protect him from flying plate shards. Both Hubert’s clothing and mallet are salient to the episode because its main repeated action requires both of them to be present. Moreover, since the episode covers his whole day’s routine, both clothing and mallet are taken up before the central actions begin and discarded after the central actions are over. As a result, clothing intended to be worn while performing central actions in an episode can be construed as similar to an instrument used in the episode. If this is the case, we would expect -er forms to be extended from instruments to clothing, as in fact they have been:

(16) loafers, sneakers, waders, loungers, boater (hat to go boating in), sleeper, jumper, romper, pedalpushers

Although this use of -er forms does not seem to have spread a great deal, I have found one novel use:

(17) stroller: fur coat of the right length and cut to stroll in.  
Example: We’re having a sale on fur coats, stoles and strollers. (with accompanying pictures of each kind of coat)

As I already noted, in basic-level episodes, human agents are more likely to be construed as the causer than the actions they are performing, due to their intrinsic salience and their temporal closeness to the central action of the episode. In other types of events where one or both of these factors are not present, the second analysis of causation will be favored, in which events rather than agents are construed to cause other events. For example, when groups of people act in concert, their salience as individual humans is
reduced. This is reflected in the acceptability of using singular noun phrases and the neuter pronoun to refer to them:

(18) As the crowd exploded onto the field, it was hotly pursued by hordes of police.
The team roared out its approval.
The union’s position was that management was out to destroy it.

With the salience as humans downgraded, the actions of the group can be construed as a separate event from the behavior of the group’s individual members, as is shown in the ways these actions are often encoded:

(19) The party was raucous. (Not: The actions of the people at the party were raucous.)
The game was boring. (Not: The actions of the people playing were boring.)
My 1:40 class is very irritating. (Not: The actions of the people attending my 1:40 class are very irritating.)

The potential separation of an event and the people involved in it is also revealed in the ambiguity of many terms which can refer to the participants of an event or to the event abstracted away from the people:

(20) The wedding was lovely, although I didn’t like the words of the service very much. (wedding = participants)
The wedding was lovely, although I didn’t care for the colors everyone wore. (wedding = event)

Thus, the transfer of a kind of agentivity from individuals to the events involving those individuals is easily motivated.

Causative events may also be construed as independent of human agents due to temporal separation. In these cases, the event causing the change in a patient is the product of a person who is outside the normal boundaries of the episode. Examples are given in (21):

(21) Noam Chomsky changed the nature of linguistic research in the twentieth century with his book, Syntactic Structures.
Syntactic Structures changed the nature of linguistic research in the twentieth century.

The choreographer moved the audience to tears with his interpretation of Swan Lake.
Swan Lake moved the audience to tears.
Sinclair Lewis used *Babbitt* to portray the crass commercialism of American society.

*Babbitt* portrayed the crass commercialism of American society.

With their film, *Star Wars*, Lucas and Spielberg changed the criteria for excellence in special effects.

*Star Wars* changed the criteria for excellence in special effects.

In all these cases, there are human agents indirectly causing the reaction of the patients, but they are all distant from the event. The possibility of using *with* and *use* to introduce these product events reveals that they can be construed somewhat like instruments, but the fact that they are also perceived as events, and as such can be construed as independent causers of reactions, is evident from their acceptability in sentences with predicates that require a causative event, or an agent instigating such an event, as their subject:

(22) John made her angry. (agent instigating action)
    The breaking of the window with a rock made her angry.
    (action)
    ?The rock made her angry. (instrument)
    The poem/book/film/play made her angry. (event)

In both the *group event episodes* and the *product event episodes*, the human agents have been downgraded in salience, either by being present in an undifferentiated mass, or by not being present in the episode at all. As with the instruments, when this happens, the event alone can be construed as agent-like since it is the only foregrounded participant remaining in the episode that has some of the qualities of a prototypical agent.

Thus, we can construct a natural continuum from using -er forms to refer to prototypical, individual agents who are present, to using them to refer to causative events participated in by a group of people, or produced by people who are absent. Such *event Er's* are exemplified in (23):

(23) **opener**: sporting event (intentionally participated in by humans) that serves to open the sport's season
    **mixer**: a party or dance (intentionally participated in by humans) that mixes people together
    **thriller**: a film or book (intentionally produced by humans not present) that thrills the viewer/reader
    **chiller**: a film or book (intentionally produced by humans not present) that chills the viewer/reader
As with instrument Er's, once it has been established that -er forms can refer to causative events where the agents are not present or are not salient in the immediate episode, the pattern can be reanalyzed to include reference to causative events that may not have an agent at all, as in (24):

(24) **bummer**: event that bums a person out  
**puzzler**: event that puzzles people  
*Example*: John acted like he didn’t want to see you again and you didn’t do anything to offend him? Hmm. That's a real puzzler.  
**shocker**: an event that shocks people  
**killer**: event that (literally or metaphorically) kills people  
*Example*: That exam/race was a real killer.  
**gully-washer**: weather event (no human agent) that washes out gullies  
**scorcher**: weather event (no human agent) that scorches living things  

And, in fact, event Er's have now spread to include reference to events that cause the action described in their base to occur in others (rather than the action being a part of the event itself) and to some events that are not causative at all:

(25) **laughter**: game or other event which causes spectators to laugh  
**weeper**: game or other event which causes spectators to weep  
**nail-biter**: game or other activity which causes spectators to bite their nails  
**groaner**: type of joke that makes the listener groan  
**cliff-hanger**: type of movie in which someone traditionally hung from a cliff  
**squibber**: action of a ball that a kicker has squibbed  
**chopper**: action of a ball that a batter has chopped  
**comebacker**: baseball hit that comes directly back at the pitcher  
**upper**: event (not drug) that causes positive feelings in the viewer  
*Example*: The Super Bowl was one of the few uppers for the Commissioner this year.  
**in-the-parker**: home run that lands inside the baseball park  
**no-brainer**: move or decision that requires no brain to perform  
*Examples:*  
a) (describing an easy putt) That's a no-brainer.  
b) (in a pizza ad) Deciding to call us for your pizza delivery is a no-brainer.

Although patients seem at first to be quite different from agents, being at the opposite end of the event-chain in a prototypical episode, there are some possible episode structures that allow plausible extensions from agents
to patients. These are episodes containing participants that can be construed as having the agent-like properties of being self-moving or self-changing, but that, like patients, are moving or changing due to the actions of another participant. When the instigators of the movements or changes differ in their actions and are distanced in time, the agent-like qualities of these participants become much more salient than their patient-like ones. So, for example, if a person turns on a burner under a pot of water and then leaves, when the water later begins to boil, the natural boundaries of the episode will exclude the instigator of the action, and the boiling water will be the most salient and agent-like element remaining. The relationship

between the construals when the agent is included in the episode and when it is not is encoded in verbs appearing in both causative and intransitive uses:

(26)  Susan is baking the cake.
       The cake is baking.

       Jeff is boiling the water.
       The water is boiling.

       Peter has cracked the nutshell.
       The nutshell has cracked.

In the second of each pair of sentences, the agent is outside the boundaries of the episode, leaving the original patient as the most agent-like element remaining. I call these entities active patients. Not surprisingly, a number of these agent-like active patients can be referred to with -er forms, as in (27):

(27)  frier, baker, steamer, broiler, roaster
       page-turner: a book that you turn the pages of, but it almost forces you to do so
       best seller: a book that is sold well, but almost sells itself

And although originally the referents may have been interpreted with their agent-like construal (e.g. a steamer is a clam that steams), the linguistic structures have been reanalyzed so that these referents are interpreted as patients (a steamer is a clam that is steamed). This is clear, because patient Er's have now been extended to include fairly prototypical patients that have few if any agent-like qualities:

(28)  dipper: something that is dipped before being eaten
       sipper: a drink that is sipped
       dunker: something that is dunked before being eaten
teether: something that is toothed on
scratcher: a lottery ticket that is scratched to reveal the potentially winning patterns
beater: a car that someone has beat up, i.e. a car in bad shape
keeper: something that should be kept (note: not something that keeps well)

Example: That class sure has a lot of expensive books you have to buy. And the worst of it is, I know most of them will be keepers.

drive-it-yourselfer: a truck that you drive yourself, like a Ryder truck

Example: It wasn’t a commercial truck; it looked more like one of those drive-it-yourselfers.

sneaker: something that was sneaked in

Example: (looking at a pair of small houses built in the middle of a much nicer group of homes)
A: There are those two little houses they snuck in up here.
B: Yeah, I don’t want to see another house put in here like those two sneakers.

Because most prototypical patients share so few characteristics with agentive prototypes, patient Er’s are still fairly uncommon; however, it is possible that they are beginning to expand.

In conclusion, the extensions of agentive -er forms from agents to instruments, causative events and patients, and from instruments to clothing, were originally based on the construction of different episode structures to accommodate less typical transitive events. However, once -er forms began to be used for entities that were somewhat atypical representatives of these new semantic cases, a reanalysis took place extending the use of these expressions to more prototypical examples of each case.

References


Subject and Object Honorification in Japanese

Peter Sells and Masayo Iida
Stanford University and Hewlett-Packard Labs

Introduction

Since the pioneering work of Harada (1976), the honorific system of Japanese has received comparatively little attention in the theoretical literature. Our purpose in this paper is to show that the system of honorification of the arguments of verbs has some very interesting and important consequences for linguistic theory.

1. Honorification

There are two kinds of honorification that we will consider in this paper, honorification of subjects, and honorification of non-subjects (which we will refer to as 'object honorification'). There are other kinds of 'performative' honorification in the language, such as honorification of addressee (Harada (1976)), which we will not consider at all.

1.1. Subject Honorification

For subjects which are considered honorable, Japanese allows optional expression of a 'subject honorific' (hereafter: SH) form, productively formed around the verb stem as indicated by the underlined forms in (1). Where possible, we will use single underlines to indicate subject honorific forms, and double underlines to indicate object honorific forms.

(1) Subject Honorification: ‘o+V+ni naru’
   a. sensee-ga Tanaka-san-o mati-mas-u
      teacher-NOM Tanaka-ACC wait.for-POL-PRES
      ‘The teacher waits for Tanaka.’
   b. sensee-ga Tanaka-san-o o-mati-ni nari-mas-u
      teacher-NOM Tanaka-ACC wait.for.SH-POL-PRES
      ‘The teacher waits for Tanaka.’

This SH form o-mati-ni naru alternates with other SH expressions, as shown in (2).

(2) a. sensee-ga Tanaka-san-o mat-are-mas-u
      teacher-NOM Tanaka-ACC wait.for-SH-POL-PRES
      ‘The teacher waits for Tanaka.’
   b. sensee-ga Tanaka-san-o o-mati-desu
      teacher-NOM Tanaka-ACC wait.for-SH.POL.PRES
      ‘The teacher waits for Tanaka.’

The form in (2)a exhibits the use of the passive morpheme as an SH marker. In (b), desu is a form of the copula, which is also used as an SH marker. A few verbs have suppletive SH forms, discussed below.
1.2. Object Honorification

For honorific non-subjects there are productive 'object honorific' (hereafter: OH) forms, illustrated in (3).

(3) Object Honorification:
   a. 'o+V+suru'
      Tanaka-san-ga sensee-o o-mati-si-mas-u
      Tanaka-NOM teacher-ACC wait.for.OH-POL-PRES
      'Tanaka waits for the teacher.'
   b. 'o+V+moosi ageru'
      Tanaka-san-ga sensee-o o-mati-moosi age-mas-u
      Tanaka-NOM teacher-ACC wait.for.OH-POL-PRES
      'Tanaka waits for the teacher.'

For convenience, we will refer to the forms in (3) as 'object honorific', even though what really is honored is, in principle, any single non-subject argument (Harada (1976)), and usually it is the one highest on the thematic hierarchy.

The OH form in (a) is formed with the verb suru, which as a main verb means 'do'. In principle, any related form of suru can be used to express OH.

1.3. Structures

There are two basically identical structures that are used in the honorific forms. One is lexical compounding (such as o-mati-suru), and the other involves a phrasal collocation resulting in a complex verb. We will not argue for this distinction here, although it is crucial in a wider understanding of the properties of the general structures that Japanese has.

The structure we assume for the OH form o-mati-suru is shown in (4).

(4)  
    V
     /
    N[+O]
     \
      V
       \
       o
       \ 
       N
        \ 
        V
         \ 
         suru
          \ 
          mati

Following standard assumptions, we assume that mati is a noun zero-derived from a verb stem. The 'honorific' prefix o- attaches to nouns, and indicates that something in the context is honored. However, the presence of o- is neither a necessary nor sufficient condition for honorification of any particular argument, as illustrated in the following subsection; morphosyntactically, it just contributes some formal feature, which we will call '[+O]' (see also Suzuki (1989)). Thus, a form like suru in its OH use will select for a noun with the [+O] specification.

For an SH form like o-mati-ni naru, the selection of naru is essentially similar. In all its uses, naru (lit. 'become') selects for an N' marked with the particle -ni, illustrated below in (6). In its honorific use, it also requires the feature [+O].
The distinction between these two types of structures does not interact with our account of honorification.

1.4. The Honorific Prefix

In most of the honorific forms that Japanese has, the whole form begins with the honorific prefix o- (sometimes go-). This form indicates that something in the context is honored, but it does not indicate which particular individual that might be; often this is pragmatically determined, as in (7), which involves not so much honorification as merely politeness.

(7) o-benyoo-si-mas-yoo!
HON-study-do-POL-let’s
‘Let’s study!’

In the next examples, in (8), nominalized verb stems modify other nouns; the honorific prefix indicates that some argument of the stem is honored, but there is no necessary restriction as to which.
We will not attempt to provide an analysis of these particular cases in this paper. However, it is clear that [+O] does not indicate the honored argument itself. In the context of the examples of verbal honorification that we will consider, we will assume that the presence of -o- provides the formal feature [+O], and that other properties of the construction determine exactly which argument is honored.

2. Interactions

In this section we would like to look at various interactions of multiple instances of the marking of honorification.

2.1. Doubled Honorification

Our first point concerns the verb suru (‘do’) which appears in (9) (as simasu). The verb suru has an irregular SH honorific form nasaru, which blocks the expected *o-si-ni naru.

(9) sensee-ga tenisu-o si-mas-u
    teacher-NOM tennis-ACC do-POL-PRES
    ‘The teacher plays tennis.’

(10) a. sensee-ga tenisu-o nasari-mas-u
    teacher-NOM tennis-ACC do.SH-POL-PRES
    ‘The teacher plays tennis.’

b. *sensee-ga tenisu-o o-si-ni nari-mas-u
    teacher-NOM tennis-ACC do.SH-POL-PRES
    ‘The teacher plays tennis.’

For future reference, some of the various forms of suru are shown in (11)a. Some other irregular SH forms are shown in (11)b.
(11) a. Forms of suru ('do'):

Plain suru
Honor. Subj. nasaru
Humble Subj. itasu
Potential dekiri
Causative saseru

b. Irregular SH forms:

do nasaru
eat mesiagaru
give kudasaru

With these irregular forms, honorification may be 'doubled', as seen in (12).

(12) a. sensee-ga tenisu-o o-nasari-ni nari-mas-u
teacher-NOM tennis-ACC do.SH.SH-POL-PRES
'The teacher plays tennis.'

b. sensee-ga unagi-o o-mesiagaru-ni nari-mas-u
teacher-NOM eel-ACC eat.SH.SH-POL-PRES
'The teacher eats eel.'

This illustrates the fact that honorification is informationally specified by forms, and that the relevant information can 'unify'. This fact would be problematic for any syntactic theory that posits an honorification 'node' in the syntactic structure, for there would appear to be two. Subject honorification has been taken to be a reflection of subject-verb agreement in languages like Japanese and Korean, and undoubtedly it is the closest thing to agreement that these languages. In current Government-Binding approaches, the idea would be that Agr (or perhaps Hon) would be one of the 'functional categories' of the clausal structure (Ahn and Yoon (1989)). The fact that honorification is marked in two places would be quite puzzling under this view.

Instead, it seems quite clear that the phenomenon of double marking indicates the need for the view that words and constructions carry information, which must ultimately be compatible, as is standard in unification-based approaches, such as HPSG or LFG.

2.2. Multiple Honorification

Our second point concerns the fact that, for many speakers, honorification may be also multiplied: the form o-mati-moosi age-ni naru shown in (13) is a form which simultaneously honors both the subject and the object.

(13) sensee-wa Tanaka-si-o o-mati-moosi age-ni nari-mas-u
teacher-TOP Dr. Tanaka-ACC wait.for.OH.SH-POL-PRES
'The teacher waits for Dr. Tanaka.'

There is some variation on examples like this: some speakers reject it. For them, it is only possible to honor one argument of the verb (as honoring two involves
placing one referent 'above' the other). However, many speakers find this form grammatically and pragmatically perfect. Note that the order within the complex verb is stem-OH-SH.

Significantly, the other order of SH and OH markers is completely unacceptable, to all speakers, shown in (14).

(14) *sensee-wa Tanaka-si-o o-mati-ni nari-moosi age-mas-u
    teacher-TOP Dr. Tanaka-ACC wait.for.SH.OH-POL-PRES
    'The teacher waits for Dr. Tanaka.'

One might think that this would just be a random fact about the particular SH and OH heads used in these examples. Interestingly, this is not true. Other types of honorific heads show exactly the same properties, illustrated in (15).

(15) a. sensee-ga Yamada-san-o o-mati-itas-are-mas-i-ta
    teacher-NOM Yamada-ACC wait.for-OH-SH-POL-PAST
    'The teacher waited for Mr. Yamada.'

    b. *sensee-ga Yamada-san-o o-mati-are-itasi-masi-ta
    teacher-NOM Yamada-ACC wait.for-OH-SH-POL-PAST
    'The teacher waited for Mr. Yamada.'

    c. sensee-ga Yamada-san-ni hon-o o-sasiage-ni nari-masi-ta
    teacher-NOM Yamada-DAT book-ACC give.OH-SH-POL-PAST
    'The teacher gave a book to Mr. Yamada.'

    d. sensee-wa Tanaka-si-o o-mati-moosi age desu
    teacher-TOP Dr. Tanaka-ACC wait.for-OH-SH-PRES
    'The teacher waits for Dr. Tanaka.'

An account of honorification must therefore explain the fact that, if multiple honorification is to be acceptable, the OH head must be 'closer' to the verb stem than the SH head, regardless of whether they are lexically or phrasally attached.

We believe that the facts here derive from a more general property of Japanese. Our hypothesis is that all SH heads are (intransitive) Raising predicates (i.e., have non-thematic subjects), while all OH heads are (transitive) Control predicates (i.e., have thematic subjects). Japanese has a general constraint which blocks Control predicates from appearing outside of Raising predicates (Kuno (1983), Nishigauchi and Takahashi (1990), Isoda (1990)). For example, the Control predicate oeru ('finish') must appear inside of subject honorification—in (16)b, it appears outside, and the example is bad.

(16) a. sensee-ga hon-o o-yomi-oe-ni nari-masi-ta (Control-Raising)
    teacher-NOM book-ACC read-finish-SH-POL-PRES
    'The teacher finished reading the book.'

    b. *sensee-ga hon-o o-yomi-ni nari-oe-masi-ta (Raising-Control)
    teacher-NOM book-ACC read-SH-finish-POL-PRES
    'The teacher finished reading the book.'
Kuno (1983) notes data like this, and expresses the generalization that transitive verbs cannot appear outside of intransitive verbs. We believe that this is better understood in terms of the difference between Control and Raising. A similar contrast shows up in the next examples with *kakeru* (‘to be about to do’) being the Raising predicate.

(17) a. ?Tarrowa yatto tabe-oe-kake-te-ir-u (Control-Raising)
    Tarrow-TOP finally eat-finish-almost-GER-be-PRES
    ‘Tarrow is finally about to finish eating.’

    b. *Tarrowa yatto tabe-kake-oe-te-ir-u (Raising-Control)
    Tarrow-TOP finally eat-almost-finish-GER-be-PRES
    ‘Tarrow is finally about to finish eating.’

While the (a) example is somewhat odd, due to the strangeness of the situation described, there is a clear contrast with the (b) example, which is totally unacceptable.

In fact, this property even holds in English.\(^1\)

(18) a. John seemed to be trying to be quiet.

    b. *John was trying to seem to be quiet.

A natural explanation for this phenomenon would lie in the semantics of Control—the controlled argument must be able to bring about the situation described (Sag and Pollard (1991)); yet the subject argument of a Raising predicate clearly lacks this property.

We believe that it is quite plausible that all SH heads in Japanese are Raising predicates (such as *desu* and *-ni naru*). They are clearly intransitive, and Kuno (1983) suggests that *-ni naru* might be a Raising predicate.

On the other hand, it is equally plausible that all OH heads are Control predicates (such as *suru* and *moosi ageru*, which both mean ‘do’, basically). Under such assumptions, the facts in (15) and (16) are explained by whatever explains (17) and (18), namely, properties of the semantics of Control.

### 2.3. Blocked Multiple Honorification

Consider now the following attempted ‘derivation’ of a multiple honorific form. As we have seen, the form *o-mati-suru* honors the object. Also, *nasaru* is the subject-honorific form of *suru*, and so putting these two together as *o-mati-nasaru* ought to be multiple honorification. Significantly, this is not the case; this form is grammatical but is subject-honorific only (and thus a variant of *o-mati-ni naru*, etc.).

\(^1\) We do not take examples like *John tried to appear unruffled* as counterevidence to this generalization. Bare adjectives after *appear* can be ‘coerced’ into a semi-agentive form, as in *(Make sure you) appear busy when the boss comes in*. However, it seems that Japanese lacks such ‘coercion’ (Sells (1991)).
(19) sensee-ga Tanaka-san-o o-mati-nasari-mas-u
teacher-NOM Tanaka-ACC wait.for.SH.(?OH)-POL-PRES
'The teacher waits for Tanaka.' (SH only)

This example could not be acceptable if it were an object honorific form, as Tanaka is not superior to the speaker.

How does this come about? We hypothesize that information about honorification derives from two sources: constructional (e.g., o+V-stem+suru) or from lexical specification (e.g., nasaru). That is to say, suru itself is not an honorific verb, but this construction with suru in it is an honorific construction. On the other hand, nasaru means that the subject is honored, as an inherent lexical property. The fact that in o-mati-nasaru the honorification is not multiplied shows that lexical information 'shuts off' possible concomitant constructional information. Interestingly, other non-honorific forms of suru such as dekiri (‘can do’) and itasu (‘humbly do’) do not block constructional honorification, as seen in the OH forms in (20).

(20) a. Tanaka-san-ga sensee-o o-mati-deki-mas-u
    Tanaka-NOM teacher-ACC wait.for.OH.can-POL-PRES
    'Tanaka can wait for the teacher.'

b. Tanaka-san-ga sensee-o o-mati-itasi-mas-u
    Tanaka-NOM teacher-ACC wait.for.OH.humble-POL-PRES
    'Tanaka (humbly) waits for the teacher.'

3. A Lexical Account of Honorification

We will present an analysis of this data in the broad terms of an information-based theory, such as HPSG (Pollard and Sag (1987)).

3.1. Pure and Deverbal Nominal Compounds

Our account of the blocked multiple honorification with nasaru requires a much closer look at the properties of suru and nasaru and the structures in which they appear.

For the verbs themselves, the only relevant difference in their properties which we assume is given in (21), and is uncontroversial.

(21) The verb nasaru has all the same properties as suru; in addition, nasaru is lexically marked as SH.

These two verbs have essentially the same distribution, the only difference being the fact of blocked multiple honorification with nasaru.²

Outside of their use as main verbs, the various forms of suru appear in structures where they are ‘light verbs’ (Grimshaw and Mester (1988)), or are phrasally compounded with either pure nominals or deverbal nominals; the first three uses are illustrated in (22). The fourth type is the OH use, as in (3)b.

---
² Of course, nasaru also blocks potential productive SH forms of suru. We assume that this is by some kind of ‘Elsewhere Principle’, which is tangential to our concerns here. Han (1991) provides an account of a similar kind of lexical blocking effect with regard to suppletive subject honorific forms in Korean.
(22) a. kodomo-ga sensee-ni tanom-are-ta yoo-ni su-ru (main)
    child-NOM teacher-DAT ask-PASS-PAST like do-PRES
    ‘The child does as asked by the teacher.’

b. gakusee-ga nihongo-no kenkyuu-o su-ru (‘light verb’)
    student-NOM Japanese-GEN research-ACC do-PRES
    ‘The student researches (does research of) Japanese.’

c. gakusee-ga nihongo-o kenkyuu-su-ru (nominal compound)
    student-NOM Japanese-ACC research-do-PRES
    ‘The student researches Japanese.’

We have seen examples of the (OH) deverbal nominal compound above, with the structure repeated here as (23).

(23)

```
  V
 / \  
N   V
 /   |
o N suru
  |
  mati
```

The combination with a pure nominal like kenkyuu (‘research’) (in (22)c above) is apparently quite similar, as seen in (24); Poser (1990) presents a detailed study of such structures.

(24)

```
  V
 / \  
N   V
 /   |
(ge) N suru
   |
   kenkyuu
```

However, there is one important difference: in (23) suru is a Control predicate, while in (24) it is a Raising predicate. The fact that it is a Raising predicate in the latter case can be illustrated by the contrast in (25), which holds for most speakers. The contrast illustrates a difference between the ‘light verb’ suru and the nominal compounding suru.

(25) a. Ya-ga mato- ni meetyuu suru
    arrow-NOM target-DAT hit do-PRES
    ‘The arrow hits the target.’

b. *Ya-ga mato-ni meetyuu-o suru
    arrow-NOM target-DAT hit-ACC do-PRES
    ‘The arrow hits the target.’
In (25)b, *suru* takes a true object in the ‘light verb’ construction; most speakers do not allow inanimate subjects for this use of *suru*, which is usually explained by categorizing it as a Control verb. That being the case, we are forced to conclude that the *sasu* which combines with a pure nominal, as in (25)a, and in the examples at stake here, is a Raising predicate.

Summarizing then, we have the following combinations.

(26) a.  (Hon. Prefix +) Nominal + Raising *sasu* (24)
   b.  Hon. Prefix + Derived Nominal + Control *sasu* (23)
   c.  Hon. Prefix + Derived Nominal + Raising -ni *naru* (5)

All forms of the verb *sasu* have both the Raising and Control counterparts, including *nasasu*.

3.2. Honorific Forms

Complex verbs like *kenkyuu suru* can be made into SH forms in a variety of ways, shown in (27). Here the honorific prefix takes the form *go-*.

(27) a. *kenkyuu suru*, non-honorific
   b. *go-kenkyuu-ni suru*, SH
   c. *go-kenkyuu suru*, SH, marginal (see below)
   d. *kenkyuu nasasu*, SH
   e. *go-kenkyuu nasasu*, SH
   f. *go-kenkyuu nasari-ni suru*, doubled SH

The form *go-kenkyuu suru* is somewhat marginal as an SH form, for reasons that we do not fully understand. There are other complications with the pure nominal compounds which may be interfering, which we unfortunately cannot address here. Putting this problem aside, from the outline in (27), it is quite clear how SH is ‘licensed’, so to speak—there must be at least one morpheme in the structure which is associated with honorification, either the *go-* prefix, or the lexical honorific verb *nasasu*, or both. For simplicity, let us assume that *nasasu* contributes the feature [+O], as a lexical property.

Note that all of these SH forms involve Raising predicates and pure nominal compounds. This recalls the generalization above that all SH forms are Raising predicates. In contrast, compound verbal structures which involve deverbal nominals involve Control predicates, and are OH forms. The generalizations that we have observed about Japanese are summarized in (28).

(28) Generalizations about Japanese:
   a. Pure nominals compound with Raising verbs.
   b. Deverbal nominals compound with Control verbs.
   c. All SH forms involve Raising verbs, with one exception: *o-V-nasasu*.
   d. All OH forms involve Control verbs.
These generalizations can be derived from the following principles, which we claim should be part of the lexicon of Japanese. The crucial part is that there are no processes of subject honorification, or object honorification per se; rather, the honorification facts are predictable from other properties of the construction, subject to lexical exceptions. This is quite analogous to the choice of controller in syntactic accounts of Control phenomena (e.g., Bresnan (1982)).

(29) Principles of the Lexicon:

   a. Any verbal structure that is specified as \([+O]\) is an **honorific verbal structure**; one of its arguments is honored. Unless lexically specified, the particular honored argument is determined by (b) and (c).

   b. Any verbal structure which is headed by Raising predicate is a **SH verbal structure**.

   c. Any verbal structure which is headed by Control predicate is an **OH verbal structure**.

The patterns that these rules predict are quite simple, and correct, shown in (30).

(30) a. **kenkyuu suru** is a non-honorific form.

   b. **go-kenkyuu-ni naru** is honorific, and as the type of **-ni naru** is Raising, it is SH.

   c. **go-kenkyuu suru** is honorific, and as the type of **suru** is Raising, it is SH.

   d. **(go-)kenkyuu nasaru** is honorific, and must be SH due to lexical information on **nasaru**.

   e. **o-mati-ni naru** is honorific, and as the type of **-ni naru** is Raising, it is SH.

   f. **o-mati suru** is honorific, and as the type of **suru** is Control, it is OH.

   g. **o-mati nasaru** is honorific, and even though the type of **nasaru** is Control, it is SH due to lexical information on **nasaru**.

Using a simplified HPSG notation, the lexical entries for honorific uses of (subject-controlled) Raising and Control verbs are shown in (31).

(31) a. Raising verb:

   \[ \text{SUBCAT} < [X], Y, N[+O, \text{SUBCAT} < [X], Y >] > \]

   \text{default: honor}(Sp, i)

   b. Control verb:

   \[ \text{SUBCAT} < \text{NP}, Y, N[+O, \text{SUBCAT} < \text{NP}, Y >] > \]

   \text{default: honor}(Sp, j; XP_j \in Y)

In (a), the Raising verb subcategorizes for a noun with the \([+O]\) feature, and shares a subject \((X)\) and any non-subject arguments (the list \((Y)\)) with it. Essentially, then, all the nouns arguments are inherited. By default, the subject's index is the referential index of the honored argument. In (b), the Control verb subcategorizes for a noun with the \([+O]\) feature, and shares any non-subject arguments (the list \((Y)\)) with it. The subject of the verb is coindexed with the unexpressed subject of the noun. By default, the some non-subject's index is the referential index of the honored argument.
Conclusion

In conclusion, we have suggested that (29) represents the basic facts to be accounted for, and the way in which that should be achieved. There is only one process of honorification, with its target predictable from the type of verb involved. Why this correlation should exist remains, at this stage, unexplained, and a topic for future research.

References


The Semantics of Guarani Agreement Markers*

Maura Velázquez-Castillo
University of California, San Diego

0. Introduction. The purpose of this paper is to describe and elucidate the semantic/functional motivations underlying the person marking system of Guarani, a language of the Tupi-Guarani family spoken in Paraguay and parts of neighboring countries. Specifically, the paper attempts to explain a morphological split in the agreement system in terms of two semantic parameters: i) the nature of participant involvement and ii) the inherent changeability expressed by the predicate stem.

It has been claimed (Bybee 1985) that the function of agreement markers is that of indexing the argument of verbs and that "agreement categories have less relevance for a verb stem than any other inflectional category" (p. 102). By relevance Bybee means the degree of effect that the meaning of a morpheme has on the semantic content of the base. I hope to show in the course of the discussion that agreement morphology in Guarani goes beyond just indexing event participants and that it provides clues to the nature of participant involvement and the component states of the process designated by the predicate.

0.1. The problem. In Guarani, the function of predication can be performed by lexical items of virtually every semantic type. Every predicate is obligatorily marked for either subject or object agreement. Agreement prefixes index the number and person of the argument cross-referenced on the predicate. In addition to marking number and person, these prefixes also seem to be sensitive to the semantic content of the predicate, as is suggested by a morphological split of this inflectional category into two sets of prefixes. One set attaches to forms designating objects, properties, and most states. Another set attaches to one- and two-place predicates designating activities and actions. For reasons that will become obvious in the course of the discussion, I will call the first set inactive, and the second, active. The inactive prefixes are also used to indicate the possessor in a nominal construction, and the direct object of a transitive verb. Table 1 below shows the two sets of prefixes.

<table>
<thead>
<tr>
<th>Number</th>
<th>Inactive</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 singular</td>
<td>che-</td>
<td>a-</td>
</tr>
<tr>
<td>1 inclusive</td>
<td>ñane-</td>
<td>ja-</td>
</tr>
<tr>
<td>1 exclusive</td>
<td>ore-</td>
<td>ro-</td>
</tr>
<tr>
<td>2 singular</td>
<td>ne-</td>
<td>re-</td>
</tr>
<tr>
<td>2 plural</td>
<td>pene-</td>
<td>pe-</td>
</tr>
<tr>
<td>3</td>
<td>i-/ii-/íñ</td>
<td>o-</td>
</tr>
</tbody>
</table>

Table 1: agreement markers.
As a first approximation to the problem, let us discuss Klimov's interpretation of similar morphological splits in agreement systems for languages of the same family (cf. Seki 1990, Klimov 1979). Along with the traditionally recognized ergative-absolutive and nominative-accusative systems, Klimov posits a third typological type, namely that of the active-stative system. According to Klimov, the structure of active/stative languages (among which he includes languages of the Tupi-Guarani family) is not oriented toward the expression of the subject/object relation, but towards the relation between active and inactive participant roles. Among other structural manifestations of this distinction Klimov mentions the existence of different sets of person markers for coding active and inactive participants. According to Seki's interpretation of Klimov's claims, the active-inactive distinction correlates with the semantic parameter of control versus lack of control of the participant involved. Thus, verbs such as ṇe?e 'to talk', guata 'to walk', and nupā 'to beat' are marked with active morphology because they are 'volitional verbs', while rasy 'be sick', porā 'be pretty', and mandu?a 'remember' are marked with inactive morphology because they are non-volitional (Seki p. 5). In other words, the opposition active-inactive correlates with the degree of agentivity of the participant role.

While I think there is certain validity to this analysis, I do not think this parameter alone will account for the range of data under consideration here. While it is true that agents always trigger active morphology, participants of very low agentivity such as inanimate movers and inanimate and animate undergoers of involuntary change of state generally take active agreement markers, eg., kacha 'swing, rock', mano 'die', kai 'burn'. I believe that this analysis needs to be expanded to include a series of interrelated semantic parameters, agentivity being only one of them. This paper will show that activity is a complex notion that can be assessed from different perspectives, and that the different factors involved can be exploited differently in different lexical items.

1. General framework. The description and interpretation of the data will be based on notional or semantic parameters developed by functional/cognitive linguists. Specifically, I will be making reference to notions of participant role archetypes and inherent processual composition developed by Langacker (1987, 1990).

In order to facilitate the discussion of the factors involved in the morphological split and choice of agreement markers, I will provide a sketch of the conceptual framework that I will be using. According to Langacker (1990 pp. 209-260), our conception of processual participants is based on a number of participant role archetypes, among which AGENT (AG), EXPERIENCER, PATIENT (PAT), MOVER (MVR) and ZERO will be of importance in the present discussion. An agent is defined as a human actor who is deliberately involved in a given action. An experiencer is defined as an individual engaged in some type of mental process. A patient is a participant which undergoes an internal change of state. A mover is a participant which changes position with respect to its surroundings. Zero is described as an empty role, or a participant that undergoes neither change, nor motion, nor experience. These role archetypes are not viewed as unrelated
categories; instead it is believed that they participate in "systemic relationships", very much like the inventory of phonemes of a given language. It is claimed that languages organize their role archetypes in terms of hierarchies which follow certain identifiable semantic parameters and which are exploited for linguistic purposes. It is important to note that these role archetypes constitute an abstraction and that in practice they seldom occur in pure form. Thus we often find a combination of roles in one single participant. Additional variation can be found depending on whether or not these participant roles are conceptualized independently of energy transfer. Thus a patient or a mover can be conceived of independently of the source that causes the change. Langacker's term for this situation is ABSOLUTE (ABS). Thus we can have an absolute patient or an absolute mover, and so on.

A related but different semantic parameter that will be appealed to is the internal configuration of the process designated by the predicate. Processes can be conceived of as evolving through time or as remaining unchanged through time. Changeability or time-stability has been considered an important semantic parameter for linguistic organization (cf. Givón 1984), yet it lacks a precise characterization. In this paper, I will appeal to one aspect of Langacker's characterization of the imperfective/perfective distinction, which I believe captures in a precise way the difference between changeable and static predicates. According to Langacker (1987), both perfective and imperfective predicates are composed of a series of states which are accessed sequentially. In the case of static predicates, which he calls imperfective, the component states are identical, while in the case of active predicates, which he calls perfective, the component states are different. So changeability amounts to differentiation of the component states while non-changeability is the absence of differentiation of the component states. With this conceptual framework in mind, let us now turn to the description and analysis of the data. I will proceed with a discussion of one-place predicates first, and then I will discuss agreement marking of two-place verbs.

2. Description and Analysis of the Data. The present analysis claims that besides indexing the number and person of the event participant/s, Guarani agreement markers have additional semantic content and function which motivate the morphological split. The function of these prefixes is to focus on a participant endowed with special conceptual salience. The inactive markers indicate that the focused participant is minimally involved in the process and that the component states of the process are undifferentiated. In general, the active markers indicate that the involvement of the focused participant in the process is relatively active and that the process designated by the predicate evolves through time.

2.1. One-place predicates. In this case, there is only one event participant and therefore only one choice for focus. All participants, except agents, will be absolute since energy transfer will not be a factor.

2.1.1. One-place predicates with inactive morphology. Objects and properties always trigger inactive morphology in a predication. Consider the following examples:
1a. (Che) che-roga  
    1s-house  
    'I have a house' 

1b. (Che) che-memby  
    1s-offspring  
    'I have a son/daughter' 

2a. (Che) che-karape  
    1s-low  
    'I'm short' 

2b. (Che) che-resa?yju  
    1s-yellow  
    'I'm pale' 

Constructions 1a-b, with object predicates, have a possessive meaning, while constructions 2a-b, with property predicates, attribute a quality to the participant involved. What is relevant for the purposes of this paper is that the involvement of the participant in 1a-2b is minimal. The participant role is to serve only as a point of reference for a certain relation.

Objects and properties in predication constitute the inactive end of the inactive-active spectrum. These predicates designate non-events, that is, the designated relation is not seen as evolving through time. Therefore, the component states of the process are identical and the participant role can be characterized as ZERO.

Predicates designating states are also generally marked with inactive markers:

3. (Che) che-kyryi  
    1s-tickle  
    'I'm tickled/ticklish'

4. (Che) che-retia?e  
    1s-happy-mood  
    'I'm in a happy mood' (a joyful person)

5. (Che) che-kane?ó  
    1s-tired  
    'I am tired'

6. (Che) che-vare?a  
    1s-hungry  
    'I'm hungry'

As can be seen in the translation of 3 and 4, some predicates of this semantic class can designate temporary as well as more permanent states. The permanent states are closer in meaning to the predicates which designate properties in the sense that the participant involvement is minimal. The involvement of the participants of temporary states, while not active, is somewhat greater in the sense that the participant experiences the state. In this case, the component states of the process are also identical, but the participant is more involved than in the case of objects and properties. All of these participants are sentient entities and can be said to be engaged in an internal process. Their role can be characterized as EXPERIENCER. The overwhelming inactive marking of these predicates can then be explained by the lack of changeability of the designated process and the relatively inactive role of the participant. There are indications, however, that in a continuum of increasing degree of activity, an EXPERIENCER is out of the purely inactive realm. The formal clues that this is the case are provided by the fact that a few states are marked with active morphology.

2.1.2. One-place predicates with active morphology. At the active end of the spectrum, we find predicates which designate motion. Thus, predicates
which involve translational and non-translational motion (Talmy's term) are always marked with active morphology:

7a. (Che) a-guata  
I 1s-walk  
'I walk'

7b. (Che) a-poñy  
I 1s-crawl  
'I crawl'

(translational)

8a. (Che) a-ku?e  
I 1s-move  
'I move'

8b. (Che) a-kacha  
I 1s-swing/rock  
'I swing/rock'

(non-translational)

These predicates designate evolving situations that clearly include different component states. The participant is actively involved in the changing situation, either by willfully initiating the movement (AG MVR) or by simply changing positions (ABS MVR).

Other human or animate activities that do not exclusively involve motion, but are nevertheless highly dynamic, are also marked with active morphology:

9. (Che) a-jeroky  
I 1s-dance  
'I dance'

10. (Che) a-jahu  
I 1s-bathe  
'I bathe'

The participant of animate activities, such as dance, talk, etc., is usually involved in performing the complex changing pattern, often willfully but in some cases involuntarily (as in the case of bodily functions). These participant roles cannot be easily labeled even with a combination of the role archetypes because additional domains are crucially invoked in their meanings. Nevertheless, it should be obvious that their involvement in the dynamic situation described by the predicate is pivotal.

A special case of animate activity is that of body posture predicates, which can designate the action of changing body posture or the state resulting from that action, and take active markers in either case, as in 13a and 13b:

11. (Che) a-ndyvu  
I 1s-spit  
'I spit'

12. (Che) a-ñe?e  
I 1s-talk  
'I talk'

The participant of animate activities, such as dance, talk, etc., is usually involved in performing the complex changing pattern, often willfully but in some cases involuntarily (as in the case of bodily functions). These participant roles cannot be easily labeled even with a combination of the role archetypes because additional domains are crucially invoked in their meanings. Nevertheless, it should be obvious that their involvement in the dynamic situation described by the predicate is pivotal.

A special case of animate activity is that of body posture predicates, which can designate the action of changing body posture or the state resulting from that action, and take active markers in either case, as in 13a and 13b:

13a. (Che) a-ñesu  
I 1s-kneel  
'I kneel'

13b. (Che) a-guapy  
I 1s-sit  
'I sit'

Examples 13a and 13b can mean either the act of kneeling or sitting respectively, or the description of the state resulting from that action. With either meaning the agreement morphology is active. All body posture predicates present this double semantic possibility, which does not result in a morphological split. Other such predicates are: ñeno 'to lie down', jayvy 'to bend', jeko 'to lean'. It is obvious why the action should be marked with active morphology, but it is
puzzling that they are also marked active when they designate a state. There are two possible non-competing explanations for this. The first one was suggested to me by Suzanne Kemmer and is as follows: The state designates a static situation (same component states), but is marked active because of the strong semantic similarity and situational link between the state and the event that has originated it. Another possible explanation is that even though the situation is static, the participant is normally viewed as having control over his/her own body posture. This explanation would be valid only if we can prove that volitionality or control alone can be a factor in determining active vs. non-active marking. This seems to be the case, as we will see later in eg. 25 lose grip vs. drop, in which the act of involuntarily dropping something triggers inactive marking while voluntarily dropping something requires active marking. This is so despite the fact that in both cases the processes described by the predicate are dynamic events.

Agentivity alone, however, is not always the determining factor. We have already seen that inanimate movers are marked active. In such cases the participant is dynamic but non-volitional. Another class of predicates that are marked with active morphology despite their low agentivity are those that involve involuntary change of state; the participant can be animate, as in 14a-b, or inanimate, as in 15a-b:

14a. (Che) a-manó  
I 1s-die  
'I die'

14b. (Che) a-pay  (animate)  
I 1s-wake up  
'I wake up'

15a. Y o-pupú  
water 3s-boil  
'The water boils'

15b. oga o-kai (inanimate)  
house 3s-burn  
'The house burns'

The role of the participant in examples 14a-15b, while non-agentive, is not minimal, since it undergoes an internal change of state. Since the energy source is not a factor, this role can be characterized as an ABSOLUTE PATIENT. When viewed absolutely, this role is a relatively active one since the change of state is portrayed as originating from the participant's own internal resources. In addition to the more than minimal participant role, the nature of the process is dynamic since it suggests different component states.

To conclude the analysis of one-place predicates, I will address the effect of active or inactive marking on those predicates which can take both.

2.1.3. One-place predicates that allow alternate construals. Finally, there are predicates which can take both the inactive and the active agreement marker resulting in two related but different meanings. Consider the following list:
<table>
<thead>
<tr>
<th>Inactive</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. che-yta</td>
<td>'I can swim'</td>
</tr>
<tr>
<td>17. che-monda</td>
<td>'I'm a thief'</td>
</tr>
<tr>
<td>18. che-karu</td>
<td>'I'm a big eater'</td>
</tr>
<tr>
<td>19. che-ka?u</td>
<td>'I'm a drunk'</td>
</tr>
<tr>
<td>20. che-kakuaa</td>
<td>'I am big'</td>
</tr>
<tr>
<td>21. che-guata</td>
<td>'I'm a fast walker'</td>
</tr>
<tr>
<td>22. che-kiriri</td>
<td>'I'm a quiet person'</td>
</tr>
<tr>
<td>23. che-tyaró</td>
<td>'I'm mature'</td>
</tr>
<tr>
<td>24. che-vevui</td>
<td>'I'm light'</td>
</tr>
<tr>
<td>25. che-poi</td>
<td>'I lose grip'</td>
</tr>
</tbody>
</table>

a-yta 'I swim'

a-monda 'I steal'
a-karu 'I eat'
a-ka?u 'I get drunk'
a-kakuaa 'I grow'
a-guata 'I walk'
a-kiriri 'I stop talking'
a-tyaró 'I mature'
a-vevui 'I float'
a-poi 'I drop'

Except for the last example, none of these predicates designate an event when marked with the inactive prefix. Instead, their meaning is very much like that of predicates which attribute a property to the participant involved. Participant involvement is therefore minimal, just as in the case of predicated properties. When these same predicates are marked with the active prefixes, however, their meaning becomes more dynamic in the sense that they designate actual events, which are performed by the participant involved. In other words, the role of the participant is relatively more active than in the cases with inactive markers. Even in the active version of example 24, which is not as dynamic as the active versions of the other predicates, it can be argued that the participant is more actively involved than in its inactive counterpart. The actual event of floating implies certain resistance to a natural tendency on the part of the participant, while in the descriptive use of the same predicate the participant is only viewed as a reference point for the relation described by the predicate.

The ambivalent roots given in 16-24 highlight the semantic differences between the two agreement marking sets. The lexical content is the same in both cases and generally includes a process of change. What the inactive marking does is to impose a static construal on the inherently dynamic lexical content. Thus, the designated processes are conceived of as types of actions that characterize the participant rather than actual instantiated actions performed by the participant. The participant role is reduced to ZERO in much the same way as the participant in a predicated property.

The case of the last example in the list is an interesting one. Unlike in the previous cases, the inactive version of the predicate does designate an actual event, just as in the active version. The difference between the two versions is that the inactive one implies lack of volitionality while the active one suggests deliberateness on the part of the participant. In this case, activity or inactivity is assessed on the basis of agentivity alone.

2.1.4. Summary. It seems, then, that the language recognizes degrees of activity among the role archetypes. The continuum below represents a progression of dynamic participant involvement ranging from minimal to maximal involvement.

ZERO < EXPERIENCER < PATIENT < MOVER < AGENT
Degree of changeability generally correlates with the degree of active involvement of the event participant. We have seen, however, that this relationship is not always proportionally maintained. One case in point is that of the PATIENT role, which does not have the highest degree of active involvement, but which, nevertheless, can be paired with highly dynamic processes.

In one-place predicates, ZERO and EXPERIENCER are marked inactive while PATIENT, MOVER, and AGENT are marked active. With one-place predicates, all these roles, with the exception of AGENT, are viewed absolutely (i.e., factoring out energy source). However, the dynamicity assessment of some of these roles changes when an energy source enters into the picture. We will see in the next section, for example, that in the presence of an AGENT, the PATIENT role is marked as inactive.

2.2. Two-place predicates. Before discussing active/inactive marking in two-place predicates, it will first be necessary to provide some background information on which participants are cross-referenced on two-place predicates. Two-place predicates must exhibit agreement for either subject or object, but not both. Which participant gets marked on the verb is determined by two hierarchies: one of persons and another of participant roles. The person hierarchy is such that the higher one in the following hierarchy gets marked on the verb: 1 > 2 > 3. The participant role hierarchy is such that when the two participants are of the same person, the AGENT gets marked on the verb. For a participant to be "higher" in these two hierarchies then means that it will be the one cross-referenced on the verb, not necessarily that the verb will receive active or inactive marking. The relevant hierarchy for the present discussion will be that of participant role. The person hierarchy is an interesting phenomenon in and of itself, but it does not bear on the choice between active and inactive markers, and will not be further considered here (for additional discussion on this matter see note 6).

The relevant question to be answered here is what determines the choice of markers. In a sense, the case of two-place predicates is less complicated since the presence of more than one participant allows for a comparative assessment of active involvement. Let us start with prototypical transitive events with an AGENT and a PATIENT. AGENTs and PATIENTs are consistently marked with active and inactive markers respectively, as can be seen in 26-30:

Active marking:

26. Maria oï-nupā i-memby
   M. 3sACT-beat 3s-offspring
   'Maria beats her child'

27. (Che) aï-nupā la-jagua
   I 1sACT-beat the-dog
   'I beat the dog'

28. (Nde) reï-nupā la-jagua.
   you 2sACT-beat the-dog
   'You beat the dog'
Inactive marking:

29. Nde che-nupă.
   you I$sINACT$-beat
   'You beat me'

30. Petei jagua nde-su?u
   One dog 2$sINACT$-bite
   'A dog bit you'

Since the agent outranks the PATIENT in level of active involvement, the AGENT receives an active marking while the PATIENT, which is static in relation to the AGENT gets marked inactive. Thus the following hierarchy is in operation:

AG > PAT

Stative two-place predicates behave like the highly dynamic ones. Thus verbs like rayhu 'to love', pota 'to want', kuua 'to know', rovia 'to believe' take active subject agreement markers:

31. (Che) ai-kuua nde-rera.
    I 1$sACT$ 2$s-name
    'I know our name'

32. (Che) a-hayhu che memby
    I 1$s-love 1$s-offspring
    'I love my son/daughter'

Despite the fact these verbs do not designate processes with component state differentiation, their subject agreement marking is active in Guarani. In these cases, EXPERIENCER (the sentient participant) outranks ZERO, whose participation is null. The hierarchy of active involvement here is the following:

EXPERIENCER > ZERO

It has been suggested (Langacker 1990, among others) that stative two-place processes such as the ones mentioned above are conceived of as abstract analogues of more energetic processes which have actual transfer of energy. Despite the fact that we do not have actual energy transfer, there is a directedness similar to that of an energetic interaction. Thus the EXPERIENCER is portrayed as directing some mental energy towards the second participant.

A special case of stative two-place predicates is that of the verb of possession reko 'have', which is also marked with active subject agreement:

33. (Che) a-reko petei kygua.
    I 1$s-have one comb
    'I have a comb'.

In this case, the possessor is active with respect to the possessed entity, whose role is ZERO, by virtue of exerting control over it:

POSSSESSOR > ZERO

In Velázquez 1989, I compared this verbal possessive construction with non-verbal ones such as those given in examples 1 and 2, and found that when it is expressed
with a verb, the possession is an alienable one while in the non-verbal case, the possessive relationship is an inalienable one. It can be argued, in the light of the present analysis, that the possessor in the verbal construction is a more active participant than in the non-verbal construction, since more control would be exerted over an alienably possessed entity than over an inalienably possessed one.

3. Conclusion. Contrary to traditional claims that agreement markers are purely structural devices devoid of meaning, this paper has shown that Guarani agreement markers are meaningful. It is claimed that their semantic contribution to the main predicate is more than just indexing participant number and person. The formal difference between the two sets of Guarani agreement markers corresponds to identifiable semantic differences of two sorts: i) degree of changeability contained in the process designated by the predicate, and ii) the nature of the involvement of the focused participant in that process.

It was found that the morphological split in Guarani agreement markers is motivated by the opposition activity vs. inactivity. The notion of activity is seen here as the result of the interplay between participant involvement and inherent changeability of the process designated by the predicate. Another point of crucial importance is that the opposition activity vs. inactivity is not a rigid dichotomy but a parameter that is present in varying degrees, with prototypical cases of inactivity (eg. predicated objects and properties), prototypical cases of activity (motion and energetic verbs), and many intermediate cases (inanimate changes of state). Since the language has only two sets of markers to signal a gradient opposition, each set covers a range of varying degrees of activity or inactivity. It was found that predicates with inherent changeability favor active marking while predicates which designate static relations favor inactive marking. Activity, however, is not judged solely on the basis of the internal configuration of the process; participant involvement was also found to be of crucial importance. Thus, volitionality or simple control, or effecting change, can qualify as active participant involvement. Typically, inherent changeability and active participant involvement correlate, but not all the factors need to be equally present for a form to qualify as active or inactive. We have seen, for example, that a form designating an essentially static situation can be marked active on account of perceived control by the focused participant; or a form designating an inherently changing situation can be marked inactive to signal lack of participant control. The several factors involved in the active/inactive opposition create a pool of possible construals that are exploited by the language in several different ways.

By including other relevant semantic parameters besides control, the analysis presented here is essentially an elaboration and application of Klimov's analysis of active/stative systems. By showing that a language can be sensitive to more factors than just initiation or control, the paper offers a new interpretation of the notion "active", and suggests that "activity" is a complex notion involving several parameters; hence the need for a careful characterization of the factors involved.
Notes

*I am grateful to Suzanne Kemmer, Ricardo Maldonado, Kathy Carey, Mary Hare and Errapel Mejias-Bikandi for providing useful discussions and comments on earlier versions of this paper. Thanks also to Ronald Langacker and the CG discussion group for their suggestions and comments.

1The use of the term "stative" as a counterpart of "active" is a little misleading since it suggests aspectual differences (such as durativity or perfectivity) that are irrelevant in the present case. I will replace the term "stative" by the term "inactive" to avoid confusion.

2This conceptual salience is generally characterizable in terms of semantic hierarchies such as the one based on the "empathy" or person hierarchy, or that based on energy flow or role hierarchy.

3These two meanings are related in the sense that the property being attributed can be interpreted as possessed by the participant involved. Indeed, with certain predicates the difference between the two meanings is completely blurred, eg., che-jare (1s-dirt) 'I'm dirty' or 'I have dirt'.

4EXPERIENCER roles, while mostly marked inactive, are not totally consistent. In particular, the semantic areas of emotion and knowledge/belief do not exhibit a consistent behavior in respect to the agreement markers. There are some forms indicating emotions which are marked with inactive agreement when functioning predicatively, while others are marked with active morphology. Thus, kuera 'bored'; poch 'angry', and aguara 'flattered' take inactive markers, while, vy?a 'happy' and kyhyje 'afraid' the active set. We can explain this small inconsistency by appealing to the sentient character of the participant and the internal process implied in this role. The marking suggests that the EXPERIENCER role has at least some degree of activity.

5The continuum presented here is meant to be valid for this particular phenomenon in Guarani, not necessarily for languages in general. It was already previously said that languages organize their role archetypes in different ways. Langacker 1986, for example states that EXPERIENCER and AGENT often group together as "active" participant types for some linguistic phenomena, while MOVER, PATIENT and ZERO group together as "passive" participant types. In his article, activity is viewed from a different perspective than here. Thus MOVER, PATIENT AND ZERO are passive in the sense that they do not initiate the interaction or energy flow in a prototypical transitive event, while EXPERIENCER and AGENT are viewed as having a high degree of initiative in the interaction designated by the predicador.

6Hierarchy of participant roles: If the two participants have the same person, the agent outranks the patient: AG > PAT. In example 26 (Maria oi-nupā i-memby 'Maria beats the child'), the agreement marker cross-references the AG, not the PAT as evidenced by the active prefix. As stated before, PAT's are marked with inactive morphology.

Person hierarchy: first person outranks second and third persons and second person outranks third person: 1> 2> 3. This hierarchy outranks the role hierarchy discussed above. Thus, a higher participant in the person hierarchy will be marked on the verb regardless of its role, as can be seen in example 29 (Nde che-nupā
'You beat me'), where the first person is cross-referenced on the verb, and in example 30 (Petek jagua nde-su?u 'A dog bit you'), where the second person is cross-referenced on the verb. In all of these cases, the patient is cross-referenced because it outranks the agent in terms of person. When first or second person act on 3rd person, the verb is marked with first or second active prefix, since the AG in these cases is higher in both hierarchies (examples 27 and 28).

References


PARASESSION
ON
THE GRAMMAR
OF
EVENT STRUCTURE
Event Construal and Case Role Assignment

Scott DeLancey
University of Oregon

While something analogous to, and often a lineal descendant of, Gruber's and/or Fillmore's original conception of semantic roles plays a major part in most current approaches to syntax, in few outside of the cognitive movement do they map directly to both a cognitive and a syntactic level of representation. Most work retreats from full commitment to the original generative conception of case roles, abandoning the notion of a direct relationship between them and either semantic or the surface syntactic representation. Those working within frameworks in which there is fairly direct mapping from case roles to surface structure (e.g. the theta roles of GB theory or the initial GR's of Relational Grammar) tend to be sceptical as to whether these roles can be given independent semantic characterization. On the other hand, much of the work done in the direct "Case Grammar" tradition has taken the semantic content of the case roles as fixed, but has tended to be lax about constraining many-to-many mappings between these roles and surface syntactic categories.

A fundamental problem which has prevented the development of a widely-accepted generative case grammar is the lack of a principled basis for determining the semantic content of case roles, and thus for identifying the roles played particular arguments of clauses. The root of this problem is the commitment—usually unarticulated, but sometimes explicit—of most linguists to an objectivist conception of semantics in general, and of the semantics of case in particular. There is a growing literature (Lakoff 1977, 1987, Hopper and Thompson 1980, DeLancey 1984, 1985a, b, 1987, 1990a, b, Schlesinger 1989) showing that the criterial approach to the definition of case categories which is part of this naive objectivism fails, and that concepts like Agent or transitive clause have the same sort of complex and sometimes fuzzy structure as other conceptual categories.

The central problem for linguistic semantics is to describe the relation between the wide and subtle variation found in the world of experience and the smaller set of categories available in a language. My papers cited above for the most part approach the problem from the world of experience end, and discuss how various subtly different types of event are sorted into the categories encoded by different morphosyntactic constructions. In this paper I want to approach the problem from the other side, and present a minimalist account of the semantics of what I will claim is a set of core case roles, which can be formulated so as to prevent the objectivist error which lies at the root of much incorrect analysis.
The objectivist error

For as long as I have taught I have taught a course in English grammar, targeted at graduate students and advanced undergraduates in linguistics and other fields. The course includes a brief discussion of case roles and how they can be thought of as mediating between semantics and syntax. The first or second time I taught the course, I gave an exam which included a strikingly original question in which the students were given sentences with selected NP's underlined and asked to identify the case roles of those NP's. One of the sentences was:

1) John threw the ball through the window.

The answers which I intended were John = Agent, the ball = Patient, and the window = Locative. But when the exams came in, nearly half the class had labelled the ball as Instrument and the window as Patient. I marked them all wrong, and wondered how I'd ended up with such a class full of dodoses. When I handed the exams back to the students, there was weeping and wailing and gnashing of teeth. I patiently explained that in this case the ball was what underwent the change of state, and was therefore the Patient, while the window in this sentence is simply a description of the path, and thus a Locative. "But", replied the students, "we were visualizing the scene with the window closed!"

Unfortunately, they were right—in terms of everything I had told them about case, the window in that scenario does indeed undergo a change of state, and thus qualifies as a Patient, and the ball is then the Instrument. But on the other hand, they were wrong—the ball simply is not an Instrument in that sentence, nor is the window a Patient. So, what I had taught them had led, by perfectly legitimate reasoning, to conclusions which are clearly wrong. Therefore there must have been something wrong, or at least seriously incomplete, about what I had taught them.

While this is a more evidently flawed miscalculation than is commonly found in the linguistic literature, it represents a fundamental error which also underlies many arguments about the theory and practice of Case Grammar which do appear in the literature. This is the notion that to say that case roles are semantic means that it should be possible to read them algorithmically off of an objective description of an incident. In this paper I will argue that this misconception is one of the major obstacles in the development of a generative case grammar, and offer a few examples of what can be accomplished once it is eliminated.

The generative conception of Case Grammar is regarded in many quarters as discredited on grounds of the apparent difficulty of developing a limited set of semantically-definable categories in terms of which
morphosyntactic facts can be systematically explained. I will argue that many of the difficulties which have impeded the development of a useful yet constrained theory of Case Grammar stem from the same misconception of the semantics of case roles which led my students to their error—the assumption that case role assignments for a sentence can be read directly from an unconstrained description of what an episode would have to be like for the sentence to refer to it.

I will also argue for one particular approach to Case Grammar, in which a core set of case roles is defined with respect to a small set of cognitive state and event schemas, on the grounds that it both provides for a principled limitation on the set of universal case roles, and automatically prevents this semantic error. Not much of the outline of localist Case Grammar which I will present here is entirely new, though parts of it are likely to seem unfamiliar to some. My purpose in this paper is not to defend this particular model, but to show that this kind of model, in which case roles are defined in terms of a constrained theory of event structure, automatically prevents the objectivist error which has been the source of many flawed analyses in the past.

Event-based characterization of case roles

The standard approach to describing a case role is, in the manner of Fillmore 1968, by prose definition. Such definitional phrases as Fillmore's "perceived instigator of the action" and "force or object causally involved in the action or state" imply a theory of actions and states, but the necessary theory has not always been perceived as a crucial component of a generative Case Grammar. This is in part to blame for the inability of linguists to agree on a set of case roles. Such prose definitions have no automatic constraints; anything can be loaded into them.

A better approach is to define at least a set of core case roles strictly in terms of a small set of state and event schemas. This seems to be becoming a popular idea (see e.g. Jackendoff 1990), but was not an explicit part of much work in Case Grammar until relatively recently. (Croft (1991) traces the approach back to Talmy 1976, though something like the idea is implied in Halliday 1967-68). If roles are defined strictly in terms of state and event schemas extra semantic detail is forced back into the verb, where it belongs.

We begin with a simple and traditional ontology of states and events, where event is defined as a change of state or location. I will assume a stringently localist hypothesis that every clause describes a literally or metaphorically locative relation between a Theme and a Location (Anderson 1971, Diehl 1975). Note that, as well-established in localist case theory and
the study of lexical metaphor (e.g. Diehl 1975, Lakoff and Johnson 1980, Langacker 1986), states as well as physical and temporal locations are Locations. We can then distinguish states from events, which describe the Theme coming to be at Loc. We neither need nor want to provide any more definition of Theme or Loc than this; the AT relation which defines its two arguments is taken to be primitive. (cf. the similar discussion in Jackendoff 1990, Langacker 1990ms, and Talmy's (1978) promising approach to interpreting these in terms of the psychological categories Figure and Ground).

Compare this with a prose definition for Theme such as "the object in motion or being located". One problem with this particular definition is its wide applicability, since, at least once we have identified states as locations, everything that can be talked about is in motion or is located. This objection may seem at first blush like a parody of an objectivist approach to case semantics, since there is presumably an assumed proviso along the lines of "which is construed in a given clause as" in any such definition. But in fact there are still linguists who are unable to get this straight. Huddleston's (1970) familiar worry about sentences like

2) The stove is next to the refrigerator.

3) The refrigerator is next to the stove.

exemplifies exactly this error. The apparent problem with these sentences can be expressed in our terms as the appearance that they each have two Themes. The argument is that since the stove is clearly a Theme in (2), it must be so also in (3), and vice versa; so that in each of the sentences each of the two NP's is Theme. The same line of argument can then prove that each is also Loc.

The correct analysis of these data is given in Gruber (1965). Each clause predicates the location of one entity, and defines the location by a landmark. The simple fact that we can infer information about the location of the landmark from the sentence does not make it a Theme. Of course each referent is in a location—just like everything else in the universe—but each sentence is about the location of only one referent. (Note that the same erroneous argument can apply to any locational predication; after all, if I say that My shoes are on my feet, does this mean that the NP my feet has the Theme case role, since its referent must be in my shoes?)

Unfortunately this error is still alive and well, and can be found for example in Dowty's worry about

the case of predicates that do not have any apparent difference at all in their entailments with respect to two of their
arguments, hence offer no semantic basis for assigning distinct role-types to these arguments ... (1989:107)

i.e. sentences like

4) Mary is as tall as John.

Although Huddleston has historical priority in bringing up the problem, he is explicitly vague on the issue of exactly which of the then current assumptions about Case Grammar is the primary impediment to a more satisfactory analysis. Dowty is quite explicit in a footnote criticizing Talmy’s analysis:

such pairs are not distinguished by any objective feature of the situation described but at best by the "point of view" from which it is described. (1989, fn. 14, p. 123)

In other words, case roles are "in the world" (cf. Ladusaw and Dowty 1988), and are to be read off from the world, not from some construal of it.

Some form of this error lies at the base of most of the problems in the development of Case Grammar. Dowty and Ladusaw are indeed correct in their supposition that given this approach to semantics, a case grammar constrained enough to be interesting is probably impossible. (I disagree with them about which of these must therefore be abandoned). The objectivist error is automatically avoided when we define the notions Theme and Loc strictly in terms of the AT relation; given that (4) must have the underlying semantic structure Theme AT Loc, there can be no question about the correct assignment of roles.

Events are changes of state (or of location); rather than being depicted as at a state/location the Theme is depicted as coming to be there. Events in this sense can be categorized into simple changes of state and more complex configurations which include an external cause of this change. We will take this as the definition of Agent. Our grammar so far consists of states and simple and complex events, or statives, inchoatives, and causatives (Croft 1991). We can define three fundamental case roles, Theme, Location, and Agent, in terms of this simple grammar of states and events:¹

5) Theme AT Loc
   Theme GOTO Loc
   Agent CAUSE Theme GOTO Loc

The essential point of this approach is that case roles are defined and assigned in terms of tightly-constrained event schemas, rather than being
assigned with reference to the larger more amorphous scenarios found in the lexical semantics of verbs.

In the generally Andersonian model developed here only these three core cases are defined. (SOURCE, which appears in the glosses to a few of the examples below, appears to be an oblique rather than a core case role, although this remains to be conclusively argued). We will take seriously the evidence of languages with "coverb" serial verb constructions that Instruments, Benefactives, etc., which in languages like English are encoded with oblique case forms, can in fact be defined as playing one of the core roles, but in a distinct event from that which assigns core case roles in the clause. The function of oblique case roles is to allow reference within a clause to actors from the scenario that do not have one of the core roles in the event schema which underlies the clause.

The Localist model and traditional Case Grammar

This model differs from traditional conceptions of Case Grammar in a number of ways, of varying relevance to my general argument. Perhaps most striking is that elements of surface structure other than NP's—in particular, predicates—are associated with underlying case roles. This has to be accomplished in one way or another in any truly localist Case Grammar (e.g. Gruber 1965, Anderson 1973, Diehl 1975), but it is irrelevant to my main argument, which can be established equally as well in a non-localist model. (Such a model will require a richer inventory of underlying state/event schemas; the localist hypothesis makes it easy to establish a principled constraint on this inventory).

Since in this model a verb can have only an underlying State or Event schema, and the most complex Event schema has only three arguments, a verb can assign only three core case roles. Again this makes my main argument easier, but is not required for it, as long as the case inventory is read directly off of a constrained inventory of state/event schemas. (Note that the set of surface case frames is larger than three because of different patterns of argument incorporation). The important aspect of the model for my present argument is that only those case roles which are automatically defined by the basic schemas are part of the inventory of core case roles. Directly stemming from this is the abandonment of the notion that all case roles are of equal status. There is an explicit distinction here between the core case roles, defined by the event schemas, and the less-constrained set of oblique case roles.

The last difference between this model and the traditional approach is that all elements of a schema must be referred to in a clause which encodes that schema. This point is essential to my argument at various points, and we
will see that it is also essential to a semantically and syntactically responsible Case Grammar.

Agents

The characterization of Theme in this approach is probably not controversial, as the Theme role has never been given the sort of elaborate and highly specific definition that notions such as Dative and Agent have. The characterization of Agent in these terms is more contentious. Most work that makes any reference to case roles has insisted on some version or other of an a priori definition of Agent which includes bulky semantic baggage—in particular animacy and volition—for which there is no obvious place in this simple event schema. While there is an idealized model of event causation, with explicit reflections in morphosyntactic structure, which incorporates these parameters, it is clear that if we intend case roles to play an explanatory role in morphosyntax, we must recognize a broader and simpler conception of Agent, which is simply the causal argument in the expanded event schema.¹

A simple definition of Agent as first cause (cp. Croft's (1991) "autonomous cause") eliminates the notorious problems of natural forces, and of similar problematic data such as these:

6) His attitude infuriates me.

7) This mess really bothers him.

8) The beauty of this vista has inspired many artists.

9) The look on her face would curdle milk.

As far as I know no substantial body of grammatical evidence has ever surfaced that the subjects of these clauses have a different case role from those of indisputably Agentive examples, nor is there any satisfactory account of what their case role should be if they are not Agents. Thus we have no justification for supposing that they are anything but Agents, which is just what our event model requires.

Event construal and case roles

A properly-constrained Case Grammar will prevent the version of the objectivist error which my students made. The problem is that the sentence which I gave them could be imagined as referring to a scenario in which both
the ball and the window underwent changes of state, and therefore in terms of an argument-centered definition, are Themes (or Patients, as I taught them at the time). The intuitively obvious explanation of why the students' answer is wrong is that the sentence is "about" what happened to the ball, not what happened to the window, in exactly the same way as (2) is about the location of the stove, not that of the refrigerator. This is explicitly represented in our event grammar by the fact that throw, like any other verb, can have only one Theme. Throw is about the change of location of the thrown object. One could also construct a sentence about the change of state of the window, but this would need a verb appropriate to that kind of change of state, such as break or smash. The window is Theme with respect to its own change of state, but is not a Theme with respect to the change of state of the ball, and thus is not a Theme (or a Patient) in the example.

My students' error is unexpected because the predicates that could be chosen to describe the ball event and the window event in this scenario are so different. In parallel examples, however, where predicates have as part of their meaning a scenario such as this which involves more than one event, even we linguists seem to get confused. The students' fundamental error is one which, sometimes but not always in subtler forms, underlies a great many arguments concerning the analysis of putatively problematic data in Case Grammar. That is the assumption that anything and everything that can be said about a situation is part of the semantic representation of any sentence which describes that situation.

Consider the traditional hay/wagon, etc., examples:

10) He loaded the wagon (with hay).

11) He loaded the hay on the wagon.

A standard approach to a Case Grammar analysis of these data starts from the assumption that because the wagon is Loc (or Goal) in (11), it must have that role in (10). But this is the objectivist error again. Taking a pile of hay and moving it all into a previously empty wagon involves two events in our sense--the hay changes its location, from being on the ground to being in the wagon, and the wagon changes its state, from being empty to having hay in it. Under the first construal the hay is Theme, under the second the wagon is. Only one of these construals at a time can be encoded in a clause. In each case the mapping of case roles to surface relations is direct: the Agent is subject, and the Theme object.

An important distinction to maintain here is between what I am referring to as the "scenario" which the verb describes, and the constrained notion of "event" which I have defined. The loading scenario involves two events, but only one event at a time can be encoded in a clause. More
evidence for such a constrained version of Case Grammar is found in the syntax of transactional predicates such as *buy* and *sell*. It has been widely observed in several different contexts that these lexical items have in some sense four semantic arguments: two individuals, the merchandise, and the payment. But neither English nor any other language has a clause type with four core arguments. What English does with these scenarios is to encode them as two- and three-argument clauses.

It has been argued (Dowty 1989:106, Jackendoff 1990:59-60), that we must analyze single arguments of clauses with these verbs as having multiple case roles. As in the case of the hay/wagon examples, the assumption underlying this analysis is that in the sentences

12) Esau sold Jacob his birthright.

13) Jacob bought Esau’s birthright (from him).

the case roles are constant, that is, *Jacob* in both is Goal (in our grammar it will be Loc), *Esau* in the first example and *him* in the second both Source, with *birthright* and the mess of pottage—which note can only be included as an oblique in either clause—both Themes. But nothing whatever in the syntax of either example bears out this analysis. Ditransitive predicates are easily described in terms of our simple schemata; they can be described as complex events in which the verb lexicalizes neither the Theme nor the Location, so that both are left as arguments of the verb. Thus a simple-minded assignment of case roles to these examples—one based only on the syntax, with no reference to the meanings of *sell* and *buy*—would give us the following:

14) Esau sold Jacob his birthright.

AGENT LOC THEME

15) Jacob bought Esau’s birthright (from him).

AGENT THEME (SOURCE)

The more elaborate structure attributed to such clauses by Jackendoff and others is based on the intuition that since Jacob and Esau play the same role in the transaction in both clauses, *Jacob* must be Loc (or Dative, or whatever) in (14) as in (15), and Esau Source in (15) as in (14). Thus it is worth pointing out that the subject of *sell* is not necessarily a Source in any sense, nor that of *buy* a Loc (or Goal):

16) My realtor sold my house.

17) My agent bought some property for me.
Note that brokers, agents, and suchlike are not normally encoded as Source; one buys through, not from, a realtor. All that is necessary to qualify as subject of either verb is Agenthood, i.e. being the cause (as far as the clause reports) of the change of (possessional) location on the part of the Theme.

On the objectivist view of case roles it is surprising that these verbs do not manage to carry their full set of apparent arguments with them. In our grammar, on the other hand, they could not do so. If the scenario which the verbs describe involves change in location of two different entities, then it involves two distinct events. Only one can be reflected in the clause structure. Both buy and sell refer to the event of which the merchandise is Theme, and the payment has no direct role in this event. A different verb, e.g. pay, must be used to construct a clause describing the event of which the payment is Theme.

Staging and event construal

Essentially the same error, seeking case role assignments in some imagined "real world", lies at the root of another set of errors which have bedeviled Case Grammar since the beginning. A prime example is the identification of a spurious class of Instrument subjects in English and some other languages, which leads inevitably to debilitating and ultimately fatal weakness in the grammar. DeLancey (1984) and Schlesinger (1989) present arguments against any notion that the inanimate subjects of transitive verbs which have generally been so analyzed are anything but Agents.

There is a range of types of data involved here. We have already discussed the category of inanimate forces such as lightning, which have long been identified as Instruments. The source of this error, as already mentioned, is the packing of the case roles with irrelevant semantic detail. An event-based Case Grammar could not permit such an analysis: the complex event schema has a slot for an Agent, and there must be an Agent in a clause encoding that schema. Obviously in events in which forces like lightning and wind are the causal agents, no other possible Agent is conceptually or even imaginarily present. Schlesinger points out that the same argument is applicable to clauses like the subordinate clause of (18):

18) The clock was ticking so loudly that it woke the baby.

Although a clock, as an artifact, seems intrinsically much more Instrument-like than natural forces, nevertheless it is hard to come up with a principled way of finding another Agent for this clause than the clock.

Another subcategory is the more controversial class of data represented by exx. such as these:
19) The janitor opened the lock with a key.
20) The key opened the lock.
21) The assassin's poison killed its victim.
22) The axe made a satisfying "chunk" when it hit the wood.
23) When the first stone hit a policeman, it provoked a violent reaction.

In these, as in the previous examples, there is an NP with the morphosyntax appropriate to an Agent, which nevertheless most linguists would want to analyze as an Instrument. Like the supposed Instruments in the previous examples, these share with true Instruments the irrelevant factor of inanimacy. But unlike lightning and ticking clocks, these represent entities which our real-world knowledge tells us could not have played the role they are described in the clause as playing without initially being manipulated by someone. That is, these cannot easily be conceptualized as autonomous causes, occupying the initial node in a causal chain.

Thus the source of the analysis of (20), for example, as having Instrument subject is the same objectivist approach to case semantics that we have been examining. The underlying argument is that since the key in (19) is an Instrument, and since (19) and (20) could refer to the same scenario, the key must be Instrument in (20) as well. An event-based Case Grammar imposes a very different analysis. The requirement that a clause reflect in its structure one of the state or event schemas means that all elements of the schema must be present in the clause. Nothing in this approach to event semantics gives us warrant to go wandering through the world which the clause suggests to our imagination looking for arguments. (20), since it is a perfectly good transitive clause, must encode the complex event schema, with an Agent that causes the change of state of the lock. That Agent can only be the key; there is no other candidate in the clause.

Schlesinger points out that many such examples manifest semantic behavior more consistent with this analysis than with the traditional one. For example, in spite of the widely asserted hospitality of English to supposed instrumental subject constructions, a sentence like (24) is odd:

24) This pencil draws lines.

In contrast, (25) is perfectly ordinary:

25) This pencil draws very thin lines.
This reflects the fact that while there is nothing odd about depicting a particular pencil as playing the causal role in effecting thin lines (as opposed to just any lines), any pencil presumably can draw lines, and it is thus hard to conceive of a particular pencil as playing any unusual causal role with respect to line-drawing in general. Similarly, outside of the popular folklore of linguists, sentences like (20) are not freely usable in English. Speakers presented with this sentence in isolation generally have a clear intuition that the key is being given some contrastive force—that the sentence evokes a context in which a particular key, rather than any other, or the key rather than some other means, was essential to the successful opening of the door.

In general, clauses like (20) and (25) are acceptable in English precisely to the extent that there is a plausible construal of the described scenario in which the supposed "Instrument" can be seen as playing an essential causal role in the complex event schema. But, by our constrained definition, to be an Agent is to be identified as the causal argument in a complex event schema—so in such clauses as these the subjects are Agents, not Instruments.

But it is not clear that any such interpretation will explain the syntax of exx. (21-23). Let us stipulate that in the most natural context for these examples the inclusion in the clause of reference to the inanimate proximal cause, but not the animate ultimate cause whose existence is inferable, is a matter of "staging", rather than of attribution to the inanimate actor of sufficient causal force to qualify it as an Agent. This is a phenomenon that is widely attributed to "pragmatics" (e.g. in Fillmore 1977), and thus considered to be non-semantic and irrelevant to the study of case roles per se.

Again, the intuition that the assassin’s poison in (21), for example, must be analyzed as an Instrument depends on the objectivist analysis which says that we know from the sentence that the poison was administered by an assassin. Then the poison, considering its role in the overall scenario, clearly best fits the definition of Instrument, while the assassin best fits the definition of Agent. But the assassin in fact has no case role in the clause (note that it is more natural in this clause to refer to its than to his victim). In (23) the putative Agent is not mentioned anywhere in the clause, sentence, or any necessary context, and indeed it is difficult to cram one into the sentence.

The error of the Instrument subject analysis here is again the error of trying to incorporate into the semantic representation of the clause inferences which, however legitimate they may be, are not in fact part of the event representation of the clause. (21) describes a complex event, of which poison is represented as the cause. As soon as we open the door to admitting into the semantic representation of a clause entities with no grammatical role in the clause (as in (21)), and even some not actually available within the discourse (as in (23)), our grammar will inevitably have the potential to allow
any number of clearly undesirable analyses. What, for example, would prevent us from analyzing a sentence like

26) He finally talked under relentless interrogation.

as having a higher Agent—the interrogator(s)—as part of its semantic representation, and then analyzing he as playing a causee role of some sort? In effect, the Instrument subject analysis of a sentence like (21) depends upon the claim that the sentence is synonymous with one like:

27) The assassin killed his victim with poison.

But this is simply not true (even leaving aside the interesting semantic effects that we get by introducing into both sentences other material, e.g. adverbials like slowly). In order to explain the syntactic reflexes of a case role analysis of a clause such as (21), we must see the "staging" phenomenon as one more example of event construal. The "real world", as we perceive it, is a complex web of causal relations. Any transitive clause presents one single cause-effect relation. There are no case roles, as a conceptual or a linguistic phenomenon, until a complex event representation has been constructed. Whatever is included in the causal slot of that representation is the Agent, for that is what an Agent is.

On Case Grammar

In the original conception of case roles in the various versions of case grammar developed in the sixties (those of Gruber, Fillmore, and John Anderson) case roles were intended to mediate between semantic and syntactic representations. Some level of semantic representation from which case roles are recoverable is thus generative, and these approaches would be as legitimately called "generative semantics" as the logic-based approach which bore that name. The arguments criticized in this paper are retreats from a strong theory of Case Grammar, in which there is a direct relation between underlying semantic case roles (whatever those be) and surface morphosyntax. The data represent variations in syntactic behavior in what are claimed to be the same underlying case. These and other data are more easily understood under a strong version of Case Grammar, once we understand that case roles, like any other semantic categories, encode construals of events rather than objective facts.
Notes
1. This classification of predicate types has a long and broad history; my thinking here most directly reflects the lexical decomposition approach of Generative Semantics and the Vendlerian approach developed by Dowty (1979) and Foley and Van Valin (1984). For present purposes differences in formalization and terminology between this and other proposals along the same lines are more expository than substantive. For example, I use GOTO instead of the BECOME function often used here (e.g. in Dowty 1979) simply to call attention to the fact that this schema represents both literal spatial motion and metaphorically motional change of state.

2. I use the vague reference to "traditional" conceptions advisedly throughout the paper; though most linguists who discuss case explicitly link their work to the foundational frameworks of Fillmore (1968, 1977) and/or Gruber (1976), there has grown up a traditional account of the semantics and syntax of case roles, such that we find papers such as Rosen 1984 and Holisky 1987 making crucial use of demonstrably incorrect conceptions of the semantics of particular case roles without explicit reference to any work in Case Grammar (see DeLancey 1985a).


4. This is a different argument from Gruber's (1965) more plausible suggestion that a single argument of a clause may have two case roles, if and only if one of them is Agent.

5. The place of the Source relation in the localist schema that I have outlined here is not entirely clear, but for the present I will assume on the basis of its syntactic behavior that it is an oblique rather than a core case role.

6. Cf. the argumentation with respect to a different phenomenon in Lakoff 1977.
References


PAPER REPRINTED FROM

BLS 17
PARASESSION

ON
THE GRAMMAR OF
EVENT STRUCTURE

DUE TO EDITORIAL OVERSIGHTS, THE VERSION
OF MICHELE EMANATIAN'S PAPER WHICH
APPEARED IN BLS 17 LACKED CRUCIAL
PHONETIC SYMBOLS. THIS IS A CORRECTED
AND UPDATED VERSION OF THAT PAPER. WE
APOLOGIZE FOR ANY CONFUSION THIS MAY
HAVE CAUSED.
Point of View & Prospective Aspect
Michele Emanatian
UC Berkeley

0. Introduction
Speaker point of view (vantage point, perspective) is known to be important in a variety of linguistic phenomena. It seems reasonable to assume that taking alternate points of view is a basic cognitive ability. In Chafe’s words, “people are able to imagine themselves seeing the world through the eyes of others as well as from their own point of view, and...this ability has an effect on the use of language” (1976:54).

We know, from Talmy’s and Langacker’s work, that vantage point is central to the meanings of many relational expressions, such as in front of and after (Talmy 1978/88, 1983; Langacker 1987). Whether I say
(1) The bong is behind the lava lamp, or
The lava lamp is behind the bong,
depends on, among other things, my vantage point in the room.

Shifts in point of view account for non-canonical choices of deictic elements in utterances about location or motion (Fillmore 1975; Traugott 1978). Either of the following sentences is felicitous when uttered by a speaker located in Berkeley addressing someone in Boston over the phone:
(2) So, I’m going to New York next week.
So, I’m coming to New York next week.

Certainly the ‘going’ sentence is the unmarked one, but the ‘coming’ sentence is acceptable when the viewpoint taken is the addressee’s (or perhaps the speaker’s own future vantage point).

Languages apparently vary in where speakers can shift their point of view to the addressee’s. Bátori (1982) reports that in several instances where English and German require or at least allow a shift to the addressee’s perspective, Hungarian requires that the speaker perspective be maintained. (3) lists English renderings of 3 Hungarian examples: the speaker’s vantage point stays anchored to his location in space.
(3) Hungarian
a. J: Come here!
   K: I’m going!

b. J: When do you come?
   K: I can’t go before 8:00.

c. J: Bring the lamp here!
   K: I take it. (Bátori 1982)

The perspective assumed needn’t be that of either speaker or hearer, of course. Fillmore 1975 describes appropriateness conditions for establishing or assuming various perspectives in discourse. For instance, come may be used in expressions of accompaniment, such as in
(4) I'll come with you,
where speaker viewpoint has been dislocated to the destination or endpoint
of the motion (that is, providing the speaker and addressee are making the
same trip) (cf. Radden 1988).

A speaker can take the perspective of a participant in a communicative
act she’s referring to, as when I say
(5) She called Alvie in the middle of the night to come over and kill a
spider.
Here I’ve taken the perspective of the desperate caller in the communicative
act I’m reporting on; hence, the use of come.

Another possibility open to a speaker is to assume the point of view
of, in Fillmore’s terms, “the subject-of-consciousness identified via ... an ‘inner
world’ predicator of the type THINK, WONDER, WISH, etc.” (1975:377-
78; cf. Rubba 1989). In the sentence
(6) Mark’s probably thinkin’ the package’ll never come,
the speaker takes the point of view of Mark, the cogitator she’s speculating
about. As Fillmore points out, this is akin to the relative freedom a narrator
has to select a point of view in "pure 3rd-person discourse". Witness the
difference between
(7) The men came into her bedroom, and
The men entered her bedroom. (Fillmore 1975:377)
The occurrence of come in the first sentence shows that the narrator’s “focus
of empathy” (Kuno 1976) is with the woman whose bedroom was entered.

Talmy (1986) discusses the Yiddish Historical Present as a case of
"de-coupling" of the speaker’s vantage point from the temporal deictic center:
it is a "presentation of the event as it would appear to a viewer concurrently
on the scene of the event"; that is, the speaker’s perspective moves back in
time.

Banfield (1982) has shown in depth that a writer’s point of view and
related degree of empathy may affect formal characteristics of a literary work,
notably the distribution of tense-aspect forms.

Reinhart’s essay on point of view in parentheticals (1983) shows that
whether the point of view taken is the speaker’s or the subject’s can have an
impact on the formal, semantic, and pragmatic properties of the parenthetical.

Speakers are able to detach their perspective from its natural location
in the speech event, to the point where they themselves are objects of
conceptualization. When a mother says to her kid
(8) Don’t lie to your mother!
we have an example of what Langacker (1987) calls "mental transfer": the
speaker dissociates herself from her actual perspective point as a Speech Act
Participant, to some other location, for expressive purposes.

Notice that for some of these examples the term “viewpoint” is being
used metaphorically - we aren’t talking about motion or location anymore
(cf. DeLancey 1981). In fact, a range of things is meant by terms like "point
of view" and "perspective"; I will not attempt a unified characterization here.

Viewpoint is a determining factor in the selection of voice and in so-
called inverse-person marking (DeLancey 1981; Van Oosten 1984), and in
the contrast between proximate and obviative in languages with deictic 4th-
person systems (Foley & Van Valin 1984). DeLancey argues that the
"Empathy (or Animacy) Hierarchy can be interpreted in terms of relative
eligibility for viewpoint placement" (1981:645). Thus
(9) A woman was struck by lightning, is more natural than
Lightning struck a woman.

The subject position is the position of natural viewpoint in English, all else
being equal. But in the second sentence it is the object NP which is higher
on the Hierarchy, and therefore the best candidate for empathy focus by that
criterion. Therefore in this case the active sentence requires more context to
make it plausible.

The present paper adds to the catalog of ways in which point of view
is linguistically significant. In the situation I describe, flexibility of speaker
perspective is part of what enables deictic motion verbs to be used
metaphorically to express future-like meaning; and that, in turn, is part of
what is allowing grammaticalization to prospective aspect to take place.

The paper describes the semantic changes that the Chagga verbs 'go'
and 'come' are undergoing as they are increasingly employed to talk about
future events. I explore budding aspectual uses of these verbs as they occur
in what I call "the infinitival complement construction". My focus is on the
relationship between the aspctual and motion interpretations of the
construction, a relationship which is transparently metaphorical. I propose
that:

a) the metaphorical uses of these verbs establish a connection between the
present situation and some future happening, and thereby instantiate the
meaning "prospective aspect"; however, grammatical status as aspect markers
has not yet been attained;
b) the seeming anomaly of a verb meaning 'come' acquiring future-like
semantics is not an anomaly, given the deictic properties of such a verb,
namely, its allowing a shift in speaker perspective; and
c) the near-aspectual use of both 'go' and 'come' can be accounted for with
a single, simple conceptualization of temporal relations, the "moving-ego
model".

1. Chagga 'come' and 'go'

In this section I present a brief and oversimplified sketch of 'go' and
'come' in Chagga.¹ (10) is an example of jenda 'to go to' in the infinitival
complement construction:

(10) lukóshika fúli
SM.1pl-COND-arrive-IND (season)
núundežino
nu-i-enda-j-jin-w-a
FOC.SM.2sg-PROG-go.to-INF-circumcise-PASS-IND
'When fuli comes, you're going to be circumcised.'
(lit., when we arrive at fuli,...)

This construction can express physical motion through space, but also allows an interpretation whereby the event encoded by the complement verb of -enda (the verb in the "infinitive", -sino 'be circumcised') takes place in the future relative to the time of going, and no actual motion takes place. Likewise (11) is an example of this use of icha 'to come'.

(11) ni 1'ndi u'chéngi korio mámbe?
COP when SM.2sg-PROG-come-INF -OM.1sg-cook-APPL-IND
(term of respect for older male)

'When are you gonna cook for me, Gramps?'
(lit., when are you coming to cook for me?)

(11) similarly could have either a motion interpretation, or a future-like interpretation, of metaphorical "motion".

Lenda and icha are basic motion verbs, used all the time to express physical motion through space. This use is exemplified in the simplex sentences given in (12) and (13). Motion is directed to or from physical locations or entities located in space, encoded as NPs or locational adverbs.

(12) basi ngá'me'ni ngaenda
well morning-LOC SM.1sg.CONSEC-go.to-IND

shuulé ngakoéya mshíki óko
school SM.1sg.CONSEC-find-IND sister my

'Then in the morning I went to school and found my sister.'

(13) káchá SM.3sg.CONSEC-come-IND
wá'kákeehá SM.3pl.CONSEC-stay-IND-here

dyúma tsiwi kámâ
week two SM.3sg.CONSEC-OM.3sg-leave-IND

'(and then) he came, and they stayed here for two weeks, and then she left him.'

In the infinitival complement construction, as in (10) and (11), the two verbs take action and state predicates in the infinitive as 'goal' complements. The i- infinitive marker coalesces with the final vowels of -enda and -cha, and the stem-initial e of -enda is lost, giving the forms -nde- and -che-.

As mentioned, examples like (10) and (11) can express motion through space on the part of the subject, or not. (11), for instance, can be a question
about when the addressee will travel to where the speaker is (or will be) and then proceed to cook for her. Or, it can be a question about - in fact, this is what it was about when it was uttered - when it will come to pass that the addressee (who already is located where the speaker is) will cook for the speaker. This interpretation, of course, involves no actual coming.

Without -enda, (10) would be 'When we arrive at full, you are circumcised', which is not a viable Chagga sentence. (11) without -cha is still coherent. It would mean 'When are you cooking for me?', which is also a question about the future (as it is in English), but about the very near future, or the "stretched present", as one of my informants put it. With -cha (i.e., 11) the passing of time is emphasized. (14) is offered to show that the presence or absence of -che- or -nde- can have truth-conditional effects.

(14) a. käendelea inyo wári
    SM.3sg.CONSEC-continue-IND INF-drink beer

    kujó nai'chépfa
    that way FOC.SM.3sg-PROG-come-IND-die-IND

    'If he continues drinking that way, he's gonna die.'
    (lit., ...he's coming to die)

b. náipfa
    FOC.SM.3sg-PROG-die-IND

    'He's dying.'

With -nde- or -che- sentences like (10), (11) and (14) get a future-like meaning: the action or state expressed by the complement verb is understood as unrealized and is expected to happen after the moment of speech.

Strictly speaking -nde- and -che- do not mark futurity. Their appearance in an infinitival complement construction with the Progressive does not make the utterance an assertion or prediction about the complement clause event or situation occurring in the future. Instead utterances like this are used to assert that the subject of 'come' or 'go' is at present on a certain path which, if followed, potentially leads to a certain state of affairs in the future. This, of course, is spatio-temporal metaphor, the means by which -nde- and -che- conventionally implicate 'future' meaning in this construction.

The non-motion meanings that -nde- and -che- express in this construction strongly resemble what Fleischman has called "prospective aspect", or prospection (cf. Comrie 1976). Prospective aspect is a future-oriented type of present relevance, a subjective psychological linking of a future event to the present.
(15) "the future action or event...is viewed by the speaker as growing out of or somehow related to the present world state" (Fleischman 1982a:96). Prospective aspect is a "[way] of viewing an event in which a non-chronological or not primarily chronological connection is established between the event and the reference point, in the case of 'present' relevance, between the event and 'now'" (Fleischman 1983:192).

The meanings of -che- and -nde- examples in the Progressive correspond closely to this concept of future-oriented present relevance. (16), for instance, is a statement about some kids' increasing tolerance for vegetables. It is the speaker's judgment of the kids' present trajectory toward a state of liking (to eat) vegetables. It is a statement about a present situation which holds potential for a possible future situation.

(16) \( \text{waɪˈchəʃɪkʊnda} \)
\[ \text{FOC.SM.3pl-PROG-come-INF-OM.8-like/INCHO} \]
'They're coming to like them.'

At this point in time, this construction is transparent to Chagga speakers - they recognize -nde- and -che- as 'go' and 'come'. But the whole complex of phonological and morphosyntactic properties (see Emanation forthcoming) indicates that -nde- and -che- are neither fully lexical nor fully grammatical, but somewhere in-between. A number of factors are conspiring toward the re-analysis of -enda and -cha as grammatical markers of prospective aspect - in this construction. It wouldn't be surprising if they continued developing into full-fledged aspectuals and maybe eventually into grammatical 'futures'.'

2. The Anomaly of 'Come' Acquiring FUTURE Semantics

It is interesting that in Chagga both verbs, which after all are opposite in their direction of motion relative to deictic center, are acquiring future-like semantics. 'Come', for motion towards the deictic center, has acquired a past tense meaning in various languages (e.g., French), but in others (e.g., Sicilian), a future meaning. 'Go', for motion away from the deictic center, has acquired a future meaning in some languages (e.g., Spanish), while in others (e.g., Catalan), it has developed a past meaning (Fleischman 1982b, 1983; Bybee, Pagliuca & Perkins 1988ms). There are some languages in which both 'go' and 'come' have become grammatical markers of futurity; for example, Lotuko, a Nilotic language of Sudan (Heine & Reh 1984).

How is it that both verbs can come to mean 'future', when only 'go' is for motion away from the here and now? In other words, a 'come' future looks odd: if events proceed from past, to present, to future, how can 'come' be used to express metaphorical motion away from now, toward the future, when its basic use is for physical motion toward the deictic center?

Fleischman (1982b) offers an answer. She argues that 'come' futures and 'go' futures each involve a different "model" of temporal relations. 'Go'
involves a "moving-ego" model, where we actors move into the future, which is a stationary medium; see Figure 1.

Figure 1

![Moving-Ego Model]

Moving-Ego Model
(based on Fleischman 1982b)

'Come' involves an alternative model, of "moving-time", as in Figure 2; in this model, the future moves, toward us, anchored at the present moment. This seems to be a reasonable and elegant solution to the puzzle, particularly since the two models have linguistic manifestations beyond grammatical futures from 'go' or 'come'. For instance, as many people have noted, English has expressions like in the weeks to come, in which the future moves, in addition to expressions like as we approach the turn of the century, which is based in the "moving-ego" model. There are similar examples from Spanish: de aquí en adelante 'from now/here to ahead' (i.e., 'henceforth') vs. en los tiempos venideros 'in time to come'.

It is not clear however that this hypothesis actually works for grammatical futurity. It does not in any case account for the polysemy of 'come' in Chagga. I have a different proposal, which uses only the "moving-ego" model for both verbs, plus a shift in speaker vantage point with 'come'. What I'd like to argue is that in this construction 'come' and 'go' may implicate a 'future' interpretation of their complement verb through metaphor; specifically, by expressing present "motion" of the actor on a path of events through time, directed toward the future. This, of course, is the "moving-ego" model.

With -nde- 'go to', movement is directed away from the deictic center, which, temporally, is the moment of speaking. The subject "moves" along a conceived time line, from the present toward the future. Example (17) for instance, is a statement about the subject's present motion toward a future state, death.

(17) mndu chu naįndelupfiia
    person this FOC.SM.3sg-PROG-go.to-INF
    na-i-enđa-i-lu-pfi-i-a
    -OM.1pl-die-APPL-IND

'This person is going to die on us.'

Figure 3 is a graphic representation of the metaphorical temporal use of -nde- for cases where it occurs with the Progressive (as it does in 17).
The viewpoint of the speaker is anchored to the speech event. The speaker, as we can see from her utterance, conceives the subject as moving away from her, heading toward the future. -nde- can be used as long as the subject’s location is anywhere along a path between present location (now) and the time in the future when the proposition will be true. The subject’s further motion along the path must be anticipated, and the path itself must be projected to end at or pass through a point where the situation expressed by the complement verb will hold.

-che-, as we have seen, can also indicate futurity through metaphorical motion. In the metaphorical reading of (16), the subject referents are moving toward some point in time, after the moment of speech, when it will be the case that they like vegetables if they continue on their present course. ‘Come’ of course expresses movement toward the deictic center. For -che- to have this future-like interpretation, it is necessary to conceive the speaker’s perspective to be at some point in the future. The point that the subject referent ‘comes’ toward is the point at which the proposition expressed by the complement will be true. In other words, I am claiming that in examples like (16), the speaker’s viewpoint is shifted toward the future, and no longer coincides with the default, the deictic center. The speaker takes the perspective of someone located in the future, observing the subject’s progress, ‘coming to’ that point where they will like vegetables.

In Figure 4, which depicts cases of -che- with the PROG, the speaker’s viewpoint is coupled to that future location (or point in time) where the proposition is realized.

The subject is conceived as moving toward the speaker, which is to say, toward that future realization point: in (16) it is the 3rd p pl (human) subject that ‘comes’.

In other words, I am saying it is not the case that the temporal use of Chagga ‘come’ has as its basis the "moving-time" model, of Figure 2.
Several examples show that it is not time that comes toward the speaker, but rather the subject who does the moving. In (18), the mover, the subject of -cha 'come', is 'I', as indicated by the 1st p sg subject marker prefix on the verb ngilenchemwia.

(18) lakini màa kujó ngilenchemwia
      but even that way FOC.SM.1sg-P.FFTV-come-INF
      kwambá rédióŋ kükékáa mndú pfo
      that radio-LOC SM.17-CONT-stay-IND person NEG

'But even so I came to tell him that there were no people in the radio.'

(See also 10, 11, & 16.) It is not the future that moves. Instead, 'come', like 'go', involves the conceptualization captured by the "moving-ego" model, but unlike 'go' also utilizes a shifted speaker perspective. Perspectival shifting is common in Chagga speech about physical motion events. In the infinitival complement construction with -che- we see the potential shiftability which is characteristic of deictic verbs of motion carrying over to the metaphorical domain of events in time.

3. Summary

I have presented a snapshot view of a change in progress. Looking at morphemes which are 'on the verge' of becoming grammatical allows us to make deeper semantic observations than are usually offered in the grammaticalization literature. There is abundant evidence that using language entails taking a point of view, and that the location of that point of view has linguistic significance. The use of Chagga motion verbs to conventionally implicate 'future' takes place through metaphor: the expression of an actor's present 'motion' on some path potentially leads to a certain event or state. "Prospective aspect" is an appropriate label for this linking between possible future event and present situation holding potential for that event. Yet -nde- and -che- do not have grammatical status as aspectuals. Both -nde- and -che- predicate metaphorical motion of their subjects. 'Go' does this straightforwardly, but 'come' in Chagga requires a shift in speaker's vantage point, away from the default case of deictic center. On the shifting account, it becomes unnecessary to attribute the temporal uses of 'go' and 'come' to two different models of temporal relations.

Finally, this story sheds some light on the nature of semantic change in the gramaticalization of tense-aspect. In a recent study about where grammatical markers of futurity come from, Bybee, Pagliuca & Perkins (1988ms) find that cross-linguistically, motion verbs are the most common lexical origin of futures. They observe that in such verbs the meaning element 'movement' in itself is not enough to support development into a grammatical future. 'Movement towards' is indispensable for the semantic change to take
place (non-perfective aspect of the source construction has also been identified as necessary). A striking pattern in their data is that, of all the conceivable motion verbs that meet this criterion (like 'arrive at', 'enter', 'move to', 'approach'), by far the most common sources of futures are 'go' and 'come'. Of course these are basic verbs, and extremely common in their spatial uses. Another feature which distinguishes them from these other verbs is that they are deictic. Why should it be that among motion verbs, it is the deictic verbs that are the most common sources of futures?

The Chagga situation presents us with a clue. The fact that the motion is deictically anchored gives a single point of location in both space and time. And this provides a take-off point for metaphorical usage. Perhaps more importantly, deictic elements have the unique property of being employable when the speaker's vantage point is decoupled from the deictic center. The flexibility this gives speakers appears to be as communicatively useful in the domain of time as in the domain of space.

Notes

1. Chagga (Chaga, KiChaga, KiChaka) is an Eastern Bantu language of Tanzania. The data for this study comes from text analysis and elicitation with speakers of the KiVunjo dialect of Central Kilimanjaro.

Orthographic conventions include: sh [ʃ]; ch [tʃ]; y [j]; j [dʒ]; t retroflex flap; r alveolar trill; and ̆ slightly fricated alveolar approximant. High tone ' and falling tone ' are marked; low tone is left unmarked.

Abbreviations include:

| APPL | Applicative |
| CONSEC | Consecutive |
| CONT | Continuous |
| FOC | Focus |
| INCHO | Inchoative |
| OM | Object Marker |
| SM | Subject Marker |

Numbers following SM or OM in examples refer to Noun Class.

2. "Infinitive" is the conventional term for what more accurately is a Class 5 nominal prefix, or a verb nominalized by this prefix. In the construction focussed on in this paper, a verb marked with the "infinitive" i- (a form unique to Chagga - Nurse 1979) serves as object complement of 'go' or 'come'.

3. In fact there is some evidence from Proto-Bantu that this may have already happened. The regular inflectional Future in KiVunjo Chagga is -chi- -chi- comes from Proto-Bantu *vij 'come', and has the reflexes -che- or -she- in the other Chagga dialects (Nurse 1979). We therefore appear to have a case of renewal.
4. The examples of grammatical 'come' Futures adduced in support of Fleischman’s moving-time analysis do not in fact support it. In Luganda and Efik for example, the subject prefixes on 'come' are Noun Class 1, 2, or 3, human: they refer to the actor, and not to the future itself nor any temporal unit. The actor 'comes' to do X, not the "highway of time".

References


Heine, Bernd & Mechthild Reh. 1984. Grammaticalization and Reanalysis in


It Can’t Go Down the Chimney Up: Paths and the English Resultative

Adele E. Goldberg
University of California, Berkeley

1. Introduction

There has been a surge of interest recently in the English resultative construction (Bresnan and Zaenen 1990, Hoekstra 1987, Jackendoff 1990, Levin and Rappaport 1990b, Randall 1983, Simpson 1983, Van Valin 1990). However, few of these accounts have attempted to explain certain co-occurrence restrictions. It is these restrictions that are the focus of this paper. The first restriction is that resultatives cannot occur with directional phrases. For example:

1. a. *Sam kicked Bill black and blue out of the room.
   (Sam kicked Bill out of the room black and blue.)

   b. *Sam tickled Chris silly off her chair.
   (Sam tickled Chris off her chair silly.)

At the same time, resultatives can co-occur with prepositional complements that are not directional:

2. a. Lou talked himself blue in the face about his latest adventure.
   b. Joe loaded the wagon full with hay.
   c. He pried the door open with a screwdriver.

Another constraint on the occurrence of resultatives is that they cannot be applied to the theme argument of ditransitive expressions. For example:

3. a. *Joe kicked Bob a suitcase open. (meaning Joe kicked the suitcase to Bob, causing the suitcase to fly open)

These constraints on resultatives do not extend to depictive or "current-state" predicates. Depictive predicates can occur with directional phrases:

4. The chef put the dish into the oven hot. (meaning the chef put the dish into the oven while the dish was hot)

And they can predicate the theme argument of ditransitive expressions:

5. Fred handed him the towel wet. (meaning Fred handed him the towel while the towel was wet)

2. The Unique Path (UP) Constraint

I would like to suggest that the above restrictions can be explained in the same way as the following, more straightforward examples:

6. a. *Ann pushed Shirley out of the window down the stairs. (on the interpretation that the stairs are not located outside the window)
   b. *Shirley sailed into the kitchen into the garden.

The constraint can be called the Unique Path (UP) constraint: if an argument X refers to a physical object, then more than one distinct path cannot be predicated of X within a single clause. The notion of a single path entails two things:

1) X cannot be predicated to move to two distinct locations at any given time t.
2) The motion must trace a path within a single landscape.
In the case of literal motion of an object, this constraint is unremarkable. However, I will be suggesting that the UP constraint applies not only to literal motion, but to metaphorical motion as well.

The stipulation that the motion must occur within a single landscape is meant, then, to rule out examples which would combine literal and metaphorical motion such as the following:

7. *The vegetables went from crunchy into the soup.

The UP constraint can be seen to be relevant to resultatives if resultatives are understood as coding a metaphorical change of location. The necessary metaphor is a general systematic metaphor involving understanding changing state in terms of moving to a new location. The mapping involved is simply:

change --> motion
state --> location

English expressions reflecting this metaphor include:

8. a. The jello went from liquid to solid in a matter of minutes.
   b. He couldn't manage to pull himself out of his miserable state.
   c. No one could help her as she slid into madness.

By allowing that resultatives metaphorically code a change of location, and understanding the UP constraint to apply to metaphorical changes of location as well as literal ones, we can explain the co-occurrence restrictions described above. That is, a resultative would be restricted from occurring with a directional because the directional, coding a change of physical location, would code a distinct path from the change of state resultative. The argument in question would be prevented from being understood to simultaneously move to two distinct locations.

Since this constraint applies to both literal and metaphorical paths, it is not strictly a semantic constraint since it is possible to undergo a change of state and a change of physical location simultaneously. That is, while the following is ungrammatical:

9. *Ann kicked her black and blue down the stairs.

it is quite conceivable that a person be kicked down the stairs and become black and blue simultaneously.

At the same time, the constraint is not simply syntactic since we will see below that it is sensitive to the lexical semantics of the verb, and since, moreover, what counts as a distinct path is a semantic notion. Therefore, this constraint appears to be a constructional constraint—that is, a constraint on the pairing of syntax and semantics.

The status of the UP constraint can be viewed as analogous to the constraint that a given role can only be expressed once per clause (Fillmore 1968). However, the UP constraint is not naturally viewed as an instance of the latter constraint since there is no precedent for calling "path" a semantic role, and path is clearly the relevant notion since the constraint holds of (combinations of) directions, routes, sources, and goals. Moreover, semantic role analyses generally assign two semantic roles, source and goal to expressions such as the following:

10. Elena ran from Harvard Square to the river.
However, there is only a single path specified.

3. Accounting for other co-occurrence restrictions on resultatives

3.1. Resultatives with Ditransitives

Concerning the restriction against resultatives occurring with ditransitive expressions, I and others have argued elsewhere that the ditransitive construction is associated with the semantics of transfer: an agent causes someone to receive something. Despite the fact that the transfer need not be actual physical transfer, there is reason to think that the recipient argument is understood to code the endpoint of an actual, projected or metaphorical path. This idea has been previously suggested by Gruber (1965) and Jackendoff (1972), and is supported by the fact that a distinct overt goal cannot be specified. For example:

11. *Bill gave John a sandwich to Bob.

The constraint against ditransitives and (additional) goal arguments can account for the ungrammaticality of the following:

12. *Joe kicked Bob the suitcase open. (on the resultative reading)

since the suitcase would be understood to move both to Bob and to an open state simultaneously, violating the UP constraint.

3.2. Two Resultatives

The fact that two distinct resultative phrases cannot co-occur can also be explained by appealing to this constraint. That is, we can successfully disallow:

13. a. *She kicked him bloody dead.

b. *He wiped the table dry clean.

on the grounds that the two resultatives designate two distinct changes of state -- that is, that they are not metaphorically understood in terms of a single path.

At the same time, the UP constraint does not prevent two non-verbal predicates from occurring if they do not correspond to two distinct changes of state. So, if one of the predicates is depictive, the constraint does not predict any restriction on their occurrence. And we find that in fact two non-verbal predicates can occur as in the following:

14. a. The clay won’t set stiff cold. (resultative+deictive)

b. You can rub the clay smooth wet. (resultative+deictive)

3.3. Multiply Specified Paths

Notice that the constraint does not state that two distinct locations cannot be specified. In fact, two locations can be specified as long as they do not define two distinct paths. For example:

15. She kicked him out of the house through the back door.

*through the back door serves to further specify the path designated by *out of the house: there is only one path, with *through the back door modifying *out of the house.

Similar to these cases, we find that if one of the resultatives is understood to be a further specification of the other, two resultatives can co-occur. In this case one serves to modify the other, and together they form a single constituent, as in:
16. a. He nailed the door closed shut.
   b. He washed his face shiny clean.
   c. He made her worried sick.

Carrying this line of thought one step further, notice that prepositional directional are not always used to designate literal changes of location, but can be used in various metaphorical ways. For example, directional phrases can be used to designate a change of psychological state:
17. a. He drove her into a state of extreme anxiety.
   b. She dragged him out of his bad mood.

They can also be used to designate changes of states of existence:
18. a. The magician transformed the scarf into a rabbit.
   b. The fisherman carved a flute out of a piece of wood.

Given this, we would predict that prepositional directional can occur with resultatives as long as one is understood to further specify the other, defining a single path. True to this prediction we find the following examples are acceptable:
19. a. He pounded the dough flat into a pancake-like state.
   b. The liquid froze solid into a crusty mass. (ex. from George Bergman)

At the same time, adjective resultatives can be used to designate a physical state that may involve a physical spatial location, as in:
20a. He knocked them apart.

Again, as we would expect, this type of example can occur with a directional that further specifies the path:
20b. He knocked them apart to different sides of the room.

These cases seem to indicate that the constraint is not against resultatives occurring with directional per se, but rather against more than one distinct path being specified.

3.4. Resultatives with Lexically Specified Paths

There is another class of co-occurrence restrictions that the UP constraint together with a metaphorical account of resultatives can account for. This class involves the failure of resultatives to occur with verbs which lexically code a physical path. That is, as Levin and Rappaport (1990a) and Simpson (1983) have pointed out, resultatives cannot occur with directed-motion verbs when used literally. For example:
21. a. *The box arrived open. (meaning arrival caused the box to open)
   b. *Jill took the child ill. (meaning the child became ill because of the traveling)
   c. *She ascended sick. (meaning the ascension made her sick)

This restriction can be accounted for by the UP constraint since these verbs lexically identify a physical path, while the resultatives would specify a distinct, metaphorical path. To further illustrate this point, notice that although throw normally entails that the theme argument moves along a physical path, when used with a resultative, no path is implied:
22. He threw the suitcase open. (this must mean that he forcefully opened the suitcase; it cannot mean that the suitcase was thrown across the room)
At the same time, many verbs of directed-motion can be used metaphorically to code changes of state. This fact in itself is motivated by the existence of the metaphor. When used in this way, verbs of directed-motion do not code a distinct path from the change of state resultative. And, as we would expect, they can occur felicitously with resultatives as long as a single path is designated. For example:

23. a. He fell asleep. (he doesn't literally fall anywhere, but metaphorically falls into sleep)
   b. He went crazy. (he does not literally go anywhere, but metaphorically moves to the state of insanity)
   c. The story brought him to tears. (he is not literally brought anywhere, but metaphorically is brought to the state of crying).

4. A note about the title

The title of this paper at the BLS conference was "You Can’t be in Two Places at Once: Paths and the English Resultative." However, this title was somewhat misleading because there does not seem to be a Unique Location constraint that corresponds to the UP constraint. That is, there does not seem to be a constraint against being in two locations if one of them is metaphorical, only against moving to two locations. For example, the following is perfectly acceptable:

24. They found her in Kansas in a deep depression.

In this example in a deep depression appears to be encoding a metaphorical location distinct from the location in Kansas. In order to avoid misunderstanding, I have chosen a different title.

The current title, "It can’t go down the chimney up" is an allusion to the riddle, What can go up the chimney down, but not down the chimney up? The oddness of the question stems from the fact that down and up tend to be interpreted consistently in both clauses as path markers. However, the answer "an umbrella," illuminates the intended interpretation that each is to be interpreted once as a path marker and once as a depictive predicate².

5. Apparent Counterexamples

The following example appears to pose a challenge to the UP constraint:

25. He pushed her through the window to her death. (ex. from Michele Emanation)

Here the phrase to her death seems to code a metaphorical path distinct from the path coded by through the window. However, to her death is an idiom which metonymically stands for "the place where she died."³ Notice:

26. He shot her dead.
   implies only that she died, while,
27. He shot her to her death.
   implies that she literally moves from the shot, becoming a physical trajectory. Similarly, there is a difference in meaning between:

28. a. He pushed her to her death. (she necessarily moves)
   b. He pushed her to death. (she does not necessarily move)
In cases where no literal motion can be implied, to her death is unacceptable:
29. a. *He annoyed her to her death.
   b. He annoyed her to death.

Therefore, in the original apparent counterexample, we can understand a single physical path to be specified: she moved out her window to the place where she died.

Another apparent counterexample is evident in:
30. Arnold pushed Jane through the workout to the point of exhaustion.

In this example, to the point of exhaustion seems to code a metaphorical path distinct from the path encoded by through the workout. However, in this case the to the point of exhaustion phrase does not predicate the theme argument, Jane, but instead acts as a temporal-like bounder of the entire event. Notice that since it is a temporal-like bounding phrase, it can only apply to potentially unbounded or atelic events, not telic ones. Therefore we find the following to be ungrammatical:

31. *He got me through the workout to the point of exhaustion. (ex. from G.Lakoff)

   Syntactically, to the point of exhaustion is attached at a level outside the first VP. Notice it can be fronted:
32. To the point of exhaustion, he pushed her through the workout.

It can also be left out of do so:
33. Yesterday, he pushed her through the workout to the point of exhaustion, and today he did so to the point of near heart-attack.

A similar type of apparent exception to the UP constraint comes from the means clause in:
34. Through his own bravery, he finally arrived safely.

If we accept without argument that the means clause "through his own bravery" codes a metaphorical path, then it seems that the main clause predicates a distinct literal path. However, the means clauses is predating the event, while the literal path encoded by arrive is predicated of the subject, Joe. Therefore, we find again that two distinct paths are not predicated of a single argument, so the UP constraint is not violated.

5.1 Changes of Position

The definition of a single path in the UP constraint required that the path be defined within a single landscape. In this way the constraint ruled out cases in which both literal and metaphorical paths were predicated of a single argument. However, the motion involved in a literal path must be distinguished from the motion involved in a change of physical shape or position. In the latter type of motion, the object undergoing the change remains anchored at a fixed location, while rearranging parts of its extension in space. It turns out that expressions which encode a change of physical shape or position can occur with resultatives or directionals which further specify that shape or position. For example, we find:

35. a. Stand up straight.
   b. He got down into a squatting position.
   c. He pounded the box down flat. (ex. from Len Talmy)
   d. The door slid open.
e. The trap door fell shut. (ex. from Paul Kay)

These cases are not ruled out by the UP constraint because the physical motion involved does not define motion to or from a location; i.e., the physical motion does not define a path through space, therefore two distinct paths are not involved.

6. About the evidence

I have argued that the reason resultatives cannot occur with literal directionals or with ditransitive expressions is that distinct paths would be specified. The fact that resultatives cannot occur with arrive, ascend, bring, and other verbs which imply a physical path stems from the fact that a change of state resultative would code a distinct path that would also be predicated of the theme argument.

We have been able to account for the fact that two resultatives cannot co-occur unless one is understood to modify the other (in which case they form a single constituent), and similarly that prepositional directionals can be used with resultatives when they are understood to modify or further specify the change of state designated by the resultative. Therefore, a wide variety of data can be accounted for by understanding the metaphorical interpretation of resultative expressions.

In arguing for this account, I have not suggested paraphrases as evidence, despite the fact that paraphrases are often assumed to be the main or even the only source of evidence for such analyses. I have avoided using them for the following reason. To suggest that because a paraphrase of an expression involves a metaphor, that the original expression necessarily involves the same metaphor, is to make an extremely strong claim. It is to claim that this particular metaphor necessarily underlies our understanding of such situations, and therefore must be inherent in any formulation of the situation. That is, by using evidence from paraphrases, we are assuming that the paraphrases construe the situation in the same way as the original expression. However, there are several other possibilities. The first is that the expression may be understood on the basis of a different metaphor. This is possible since it is typically the case that there is more than one metaphorical understanding of a given domain.

For example, along with understanding changes of state in terms of changes of location, Jane Espenson (personal communication) has noticed that we can understand changes of state in terms of changes of shape. Examples of this include:

36. a. She re-shaped him.
   b. She molded him in her image.
   c. He was unbendable on most issues.

Another possibility is that a metaphorical understanding is necessary, but the expression itself is underspecified as to which metaphor is chosen. For example, we know that change can be understood in terms of motion to a new location or change of shape, but examples such as:

37. The lizard changed colors.

do not clearly indicate any particular metaphor. A third possibility, is that the expression is understood literally, without reference to any metaphor.
Paraphrases can be used to argue that a given metaphorical understanding has linguistic reflexes in a particular language — that is, that metaphors are not being stipulated on an ad hoc basis. I have used expressions that do not involve resultatives but do reflect the metaphor for this purpose. However I have suggested that a metaphor is involved specifically in the resultative construction, not on the basis of paraphrases, but on the basis of the fact that a variety of often subtle co-occurrence restrictions can be accounted for given the metaphorical account. That is, the metaphor allows us to make generalizations.

7. Alternative Analyses

It may be suggested that we can avoid appealing to the metaphor by reformulating the UP constraint as a target domain constraint. In this way, we might be able to avoid reference to any metaphorical interpretation of resultatives. That is, it may be suggested that the constraint can instead be stated as follows:

Unique Change of State Constraint: if an argument X refers to a physical object, then more than one distinct change of state cannot be simultaneously predicated of X within a single clause. This constraint would require that:

1) X cannot be predicated to undergo two distinct changes of state at any given time t.

2) Any sequence of changes must be understood to involve the same type of change.

In order for this formulation to account for the co-occurrence restrictions between resultatives and directionals, it would require that we consider changes of location to be instances of changing state. In this way, what had up to now been analyzed as involving two distinct paths could be reanalyzed as involving two distinct changes of state. That is, we could try to account for the data cited above without recourse to any metaphors.

However there is reason to prefer the Unique Path formulation to this one. In order for the latter formulation to be viable, we would need to consider all changes of location as instances of changing state, not only those which specify a final destination. For example in the following:

38. Joe moved Bob toward the door.

the direct object, Bob would necessarily be understood to undergo a change of state. But if we generalize the notion of "change of state" to this degree, it seems that undergoing any kind of effect would entail a change of state. But this would entail that Bob undergoes a change of state in, for example:


And then the proposed Unique Change of State constraint would be violated by sentences such as:

40. Joe kicked Bob into the room.

Moreover, I have not argued that all of even the clear instances of changes of state involve the metaphor. That is, there is no evidence that I know of that simple causative verbs involve the metaphor. For example, although break is a causative verb, we have no reason to think that it is necessarily understood in terms of causing to move to a broken state. And, if we let the UP constraint be our guide, then there is good reason to think that it does not involve the metaphor. That is, we find that break can occur with a literal directional:
41. He broke the walnuts into the bowl.

For these reasons, I have chosen to retain the UP constraint in favor of a Unique Change of State constraint.

It is also worth pointing out why the UP Constraint is preferable, in accounting for the data presented here, to a general constraint that there can only be one event per clause. The problem with the latter constraint is that it is difficult to define event in a non-circular way; that is, if we take care to avoid stipulating that an event is whatever is described in a single clause, then it is not clear that the constraint can explain the relevant cases. For example the following:

42. *She kicked him black and blue down the stairs.

although unacceptable, does not clearly describe more than one event, while:

43. a. Elena traveled from Pennsylvania through NY to Boston.
   b. Susan frightened Eric into a marriage proposal.

although acceptable, can easily be interpreted as involving what seems to be more than one event.

The account presented here of the co-occurrence restrictions described above can also be contrasted with two accounts that have been suggested in the literature. Simpson (1983) suggests that the co-occurrence restrictions against resultatives occurring with directionalss are accounted for by the principle that only one XCOMP, or predicative complement, can appear in a given clause. This account takes both resultatives and prepositional directionalss to be XCOMPss. In the case of prepositional directionalss, this is a move away from their more traditional category of Obl, but it is a reasonable move since directionalss can be understood to predicate the theme argument. By distinguishing directionalss from other prepositional complements, Simpson's account can satisfactorily explain why resultatives can occur with other prepositional complements, but not specifically with directionalss. At the same time, depictive predicates are analyzed as XADJUNCTs, and so they are not subject to the same constraint.

However, Simpson's account fails to generalize over the fact that resultatives cannot occur with ditransitive expressions. That is, ditransitive expressions are analyzed as involving a Subj, an Obj, and an Objθ; the fact that the resultative XCOMP cannot be added is not explained. Moreover, this account does not generalize to account for why directed-motion verbs when used literally cannot occur with resultatives, but can when used metaphorically to code a change of state. Finally, this account has the problem of explaining why it is that two directionalss can co-occur as long as a single path is designated. For example:

44. Ken drove to LA from Pittsburgh.

Notice, we cannot readily claim in this example that a single constituent is involved because only can have as its focus anything in its sister constituent (McCawley 1986), and yet we find that only cannot have as its focus Pittsburgh in the following example:

45. *Ken drove only [to LA from Pittsburgh.]

This fact argues strongly against to LA from Pittsburgh being treated as a single constituent.

The second suggestion for accounting for many of the co-occurrence restrictions cited here comes from Levin and Rappaport (1990a) who follow Tenny
(1987) in arguing that resultatives act as delimiters or bounders of events, and that a clause can only be delimited once. This claim is used to account for the non-occurrence of resultatives with verbs like *arrive*. They note that *arrive* is inherently delimited because it is an achievement predicate, and cannot be delimited again by a resultative. However, both accomplishment and achievement predicates, which are inherently delimited in Tenny’s sense, often occur felicитously with resultatives. For example:

46. a. The water froze solid. (achievement)
   b. The door closed shut. (achievement)
   c. Nina broke the walnut apart. (accomplishment)

Moreover, directionals do not always serve to delimit the event. Directionals can be used to specify a direction, without implying any endpoint or delimiting point, as in:

47. She kicked him toward the door.

However these non-delimiting directionals are also restricted from occurring with resultatives:

48. *She kicked him black and blue towards the door.

Presumably we would like to have the same constraint account for both examples 47 and 48. For these reasons, Levin and Rappaport’s suggestion can be seen to be inadequate.

8. Associating the metaphor with the construction

If we accept the metaphorical analysis presented here, the question arises as to where the metaphor should be stated. Since it is commonly accepted that the main verb is the pivotal element in the clause, we might consider noting the relevant verbs with the metaphor, Change of State is Understood as Change of Location. However, it is clear that although verbs of change of location can occur in this construction as in:

49. He drove her crazy.

most of the cases do not involve verbs which lexically code motion. To associate the metaphor, for example, with the verb kick, that is, to stipulate that kick, when used to imply a change of state is understood to code a metaphorical change of location, seems to miss the point that the metaphor has been shown to be involved specifically with resultatives.

At the same time, the metaphor cannot plausibly be associated with the adjective because there is no reason to think that the metaphor concerning change of state is involved when these same adjectives occur in stative predications. Therefore, the metaphor must be associated directly with the resultative construction, however that construction is captured in the grammar. If the resultative is captured by a lexical rule, then the metaphorical interpretation should be notated on the output of the rule; if the resultative is captured by construction or constructional idiom, as has recently been proposed by Jackendoff 1990, the interpretation of the construction will have to make reference to this metaphor.

Endnotes

1. I would like to thank George Bergman, Michele Emanatian, Jane Espenson, Hana Filip, Jean-Pierre Koenig, Alan Schwartz and especially George Lakoff for helpful criticisms and comments on an earlier draft. All errors are
solely my own.

2. I thank George Bergman for suggesting this as a title.

3. I would like to thank Jane Espenson for suggestion the idea that a metonymy was involved.

4. It should be kept clear that I have not argued that all expressions which notionally refer to a change of state are necessarily understood on the basis of change to a new location. For example, I have no evidence to suggest that the following are understood on the basis of motion to a new location:
   a. He opened a can of peas.
   b. He caused the canvas to become red.

References


Levin, Beth and Malka Rappaport. ms (1990a). The Lexical Semantics of Verbs of Motion: The Perspective from Unaccusativity.

____________ ms (1990b). Wiping the Slate Clean: A Lexical Semantic Exploration.


THE CONCEPTUAL STRUCTURE OF INTENTIONAL ACTION: DATA FROM KATHMANDU NEWARI

David Hargreaves
University of Oregon
Eastern Oregon State College

1.0 INTRODUCTION.

Consider a common intuition about intentional action: an individual has something in mind, a plan or goal, and initiates a behavior, typically a movement, in accordance with the plan. More specifically, we might characterize intentional action as self-initiated force in accordance with a particular mental representation. This paper argues that the Newari system of finite inflection construes intentional action in just this fashion.

This account is consistent with a number of approaches to the problem of intentional action, in particular, Brand’s (1979; 1984) work in the philosophy of action, Delancey’s (1986; 1990) work on the Lhasa Tibetan auxiliary system, and Budwig’s (1990) work on agency in child language acquisition. Following suggestions by Brand (1984), we can distinguish two components of intentional action corresponding to two traditionally distinct semantic domains.²

The first domain views intentional action from the perspective of propositional attitudes and is concerned with the idea that the actor has a particular mental state, the contents of which characterize and structure the action. We can call this the representational domain (cf. Fauconnier 1985; Jackendoff 1987; Kamp 1990; Searle 1983; Sells 1987).

On the other hand, from Sapir’s (1917) earliest discussion of active case marking through Talmy’s (1976; 1988) seminal work on causation types and force dynamics, intentional action has often been viewed as a type of force dynamic, a self-initiated force without causal antecedents. Thus, the second domain is concerned with the idea that an individual initiates and guides a behavior independent of causal antecedents. We can call this the force dynamic.

2.0 THE NEWARI INFLECTIONAL SYSTEM.

The Newari inflectional system, first described and analyzed by Edward Bendix (1974; 1983) and Austin Hale (1980), both of whom circumscribed the essential aspects of the system, can be summarized in roughly the following way. There is a set of verbal inflections, which I’ll call simply SET1, that only occur with those verbs that can plausibly be interpreted as involving a self-initiated force dynamic, provided that the attribution of this force dynamic to an individual is consistent with certain
evidential or logophoric principles.\(^3\) In simple clauses, the SET1 inflectional form occurs whenever:

1) the verb describes an action type involving the initiation of force/movement by an actor, and

2) the speech act is either: (a) declarative and the actor is first-person, or (b) interrogative and the actor is second-person.

The declarative paradigm below is illustrated with two classes of verbs. The verb **ton**- 'drink' describes a type of event which normally involves a self-initiated force dynamic; these will be called Control verbs. In contrast, the verb **thu**- 'realize, understand’ does not describe any kind of force dynamic which one may initiate; these will be called Non-Control verbs. Note, then, the SET1 form in [ex.1], in contrast to the rest of the paradigm.

<table>
<thead>
<tr>
<th>Control</th>
<th>Non-Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) jǐ: O:pwO ton-a 1ERG alot drink-SET1 &quot;I drank a lot.&quot;</td>
<td>jǐ: thul-O 1ERG realize-SET2 &quot;I realized (it).&quot;</td>
</tr>
<tr>
<td>(2) chō: O:pwO ton-O 2ERG alot drink-SET2 &quot;You drank a lot.&quot;</td>
<td>chō: thul-O 2ERG realize-SET2 &quot;You realized (it).&quot;</td>
</tr>
<tr>
<td>(3) wō: O:pwO ton-O 3ERG alot drink-SET2 &quot;S/he drank a lot.&quot;</td>
<td>wō: thul-O 3ERG realize-SET2 &quot;S/he realized (it).&quot;</td>
</tr>
</tbody>
</table>

The SET1 form occurs only with first person and a Control verb. A SET1 form with a Non-Control verb, such as **thu**- 'realize, understand’, is not acceptable, nor is the SET1 form acceptable anywhere else in the declarative paradigm for simple clauses.

Now, contrast the declarative paradigm with the interrogative paradigm below, noting the 2nd person form in [ex.5]. In contrast with the declarative paradigm, in the interrogative paradigm, the SET1 form occurs only with second person and a Control verb. This contrast is neutralized with the Non-Control verb.

| (4) jǐ: O:pwO ton-O la 1ERG alot drink-SET2 Q "Did I drink a lot?" | jǐ: thul-O la 1ERG realize-SET2 Q "Did I realize (it)?" |
What accounts for this distribution? A necessary, but not sufficient feature is that the verb must be of the Control class. However, if it were simply a case of lexical properties, the paradigm would have a straight active/non-active distribution. What is it, then, that accounts for the person and discourse role asymmetries?

First, consider what is entailed by saying that an intentional action involves a particular mental representation. The mental representation has a specific content, which, strictly speaking, is only directly accessible to the actor. Therefore, since the content of the mental representation is only directly accessible to the actor, and calling an action intentional entails a force dynamic in accordance with a mental representation, it follows that there is an irreducible person asymmetry in the direct attribution of intentional action to an individual.

In principal, then, only the person who performs the action has the evidential authority to claim directly that the force dynamic was, in fact, in accordance with the contents of the mental representation. All other claims are inferential. Thus, along with our characterization of intentional action as force in accordance with a mental representation, we can add an evidential principle of privileged access to mental representations.

Finally, there is a third factor to consider, familiar from the prescriptive tradition of English "shall" vs. "will" (Boyd & Boyd 1980). The evidential principle of privileged access, and the person asymmetry which is entailed by it, interact with the roles of the participants in a speech event, in the following sense: From pragmatic theory we make the assumption that one of the pre-conditions for a declarative speech act is that the speaker has evidential authority for the information in the utterance; in contrast, one of the pre-conditions for an interrogative speech act is the assumption that the addressee has the evidential authority for the information in the utterance (cf. Gordon and Lakoff 1971). In short, the principle of privileged access interacts with the polarity of epistemic authority in statements and questions. The speaker in a declarative speech act and the addressee in an interrogative speech act share a common discourse role, which we can call the epistemic authority.

These three components, then, can together account for the distribution of the Newari inflection forms (cf. Hargreaves to appear). First,
there is a conceptual model of intentional action in which: (a) an individual initiates and guides force or movement independent of causal antecedents, and (b) the force dynamic is in accordance with a particular mental representation. Second, there is an evidential principle constraining privileged access to mental representations. Third, a discourse/pragmatic principle attributes the role of epistemic source to the speaker in declarative utterances and the addressee in interrogative utterances.

3.0 INTENTION AS A FORCE DYNAMIC.

The distribution of SET1 forms suggests that there is something about the attribution of intentional action that makes it subject to evidential and discourse role constraints. The distribution of SET1 forms follows directly if the conceptual structure of intentional action is construed as involving an internal state subject to the principle of privileged access.

One possibility is that the internal state can be construed in terms of a primitive feature, e.g. (+/-) Volition, which is then viewed as an internal state subject to evidential constraints. However, the evidence suggests that this view of intentional action as having a simple feature (+/-) Volition is not quite adequate.

Consider again our SET1 example with the verb ton- 'drink', repeated in [ex.7] below:

(7)  jì: O:pwO ton-a
     1ERG alot drink-SET1
     "I drank a lot."

SET2 forms are not acceptable with first person Control verbs, except, however, with evidential disclaimers, as in [ex.9-11] below.

*(8)  jì: O:pwO ton-O
     1ERG alot drink-SET2

(9)  jì: mO-cae:kkO O:pwO ton-O
     1ERG NEG-feelingly alot drink-SET2
     "I (unconsciously) drank a lot/too much."

(10) jì: O:pwO ton-O khOnisa
     1ERG alot drink-SET2 it.appears
     "(It appears) I drank a lot/too much."

(11) jì: O:pwO ton-O hŌ
     1ERG alot drink-SET2 it’s.said
     "(It’s said) I drank a lot/too much."
It's important here to note that in [ex.9-11], the actor initiates and guides the force, remaining the proximate causal antecedent of the action. That is, the force dynamic in [ex.9-11] does not differ from [ex.7]. In fact, without some explicit causative morphology, it is impossible to construe the verb *ton-* 'drink' without self-initiating force.

What distinguishes [ex.9-11] from [ex.7], then, is not the force dynamic itself, but rather the sort of relationship which is asserted between what the actor was aware of, or had in mind, and what the clause, or more specifically, the predicate phrase (VP) characterizes as the force dynamic and action sequence. In other words, SET1 inflectional forms co-index the contents of the actor's mental representation at the time of the action with the semantic content of the action as it is characterized in the clause.

In [ex.9-11], SET2 inflection follows from the fact that, as characterized in the clause, the particular force dynamic was not what the speaker had in mind. The evidential disclaimers obviate the representational component but not the force dynamic. In contrast to [ex.9-11], the SET1 form in [ex.7] indicates that the force dynamic, as characterized in the clausal semantic representation, was in fact initiated and guided in accordance with the actor's mental representation, i.e. plan.

Notice the dilemma this creates for a simple binary Volitional/Non-Volitional distinction. If we identify the feature (+)Volition with the force dynamic, we end up saying that the "drinking a lot" was volitional in all cases; we have not distinguished cases such as [ex.7] from those in [ex.9-11].

On the other hand, if we say the feature (+)Volition characterizes the unified concept "force in accordance with an appropriate representation", then we are left without a way to characterize the force dynamic independently of the evidential considerations. In fact, the force dynamic underlies the distinction between the Control class of verbs, which potentially allow SET1 inflection, and non-Control verbs, which categorically prohibit SET1 inflection. Thus, we need to distinguish the force dynamic from the representational considerations.

It makes more sense to identify two domains which make up the conceptual structure of an intentional action: force dynamic and representational, both of which must be present to characterize an action as intentional.

3.1 Fluid Verbs. In fact, there is a small, intermediate class of Fluid verbs, which allow either SET1 or SET2 inflection, without requiring evidential disclaimers. The behavior of this Fluid class, in contrast with the Control and Non-Control classes, suggests that the force dynamic is best viewed as part of the lexical structure of Control verbs.

Consider the following contrast between the Control verb *dan-* 'stand up', the Fluid verb *dun-* 'submerge', and the Non-Control verb *then-* 'arrive,
reach'. As we have seen, with the Control class, as in [ex.12-14], the SET2 form is unacceptable without an evidential interpretation.

(12) ji lasa-e dan-a
1ABS bed-LOC stand-SET1
"I stood up in the bed."

*(13) ji lasa-e dan-O
1ABS bed-LOC stand-SET2

(14) ji mO-caeekO lasa-e dan-O
1ABS NEG-consciously bed-LOC stand-SET2
"I unconsciously stood up in the bed."

With Fluid verbs, on the other hand, both SET1 and SET2 are possible without evidentials. In [ex.15] below, SET1 indicates the self-initiated force dynamic; in [ex.16] below, SET2 indicates the absence of the force dynamic. In other words, [ex.15] is just like a Control verb, while [ex.16] is just like a Non-Control verb.

(15) ji lOkh-e dun-a
1ABS water-LOC submerge-SET1
"I dipped into the water."

(16) ji lOkh-e dun-O
1ABS water-LOC submerge-SET2
"I sank in the water."

However, Non-Control verbs [ex.17-18] do not allow SET1 forms.

*(17) ji chê-e then-a
1ABS home-LOC arrive-SET1

(18) ji chê-e then-O
1ABS home-LOC arrive-SET2
"I arrived home."

Defined by these distributional criteria, the class of Fluid verbs is actually quite small; and is subject to significant speaker variation. The list of verbs which I have found to allow either SET1 or SET2 forms without evidentials is given below:
Fluid Verbs

gwara tul- 'roll over' napO=la-thwa- 'meet',
sOn- 'move' thi- 'bump/kick'
kha- 'shake, tremble' thi- 'touch'
dun- 'submerge, dip' ghwa- 'bump/elbow'
ju- 'become' ca- 'feel,sense'

This suggests that we can represent lexical markedness properties of the force dynamic by saying that the concept of an initiating force is conflated (in the sense of Talmy 1985) as part of the lexical structure of Control verbs, but is unspecified for Fluid verbs, and absent for Non-Control verbs.

<table>
<thead>
<tr>
<th>dan-</th>
<th>'stand up'</th>
<th>Control</th>
<th>[INITIATE FORCE + MOTION]</th>
</tr>
</thead>
<tbody>
<tr>
<td>dun-</td>
<td>'submerge'</td>
<td>Fluid</td>
<td>[( )] MOTION]</td>
</tr>
<tr>
<td>then-</td>
<td>'arrive'</td>
<td>Non-Control</td>
<td>[MOTION]</td>
</tr>
</tbody>
</table>

In other words, SET1 inflection entails the force dynamic and asserts that the force is in accordance with the mental representation. In contrast, SET2 indicates no appropriate relationship between the force dynamic and the representation; this can be a result of the fact that:

(a) there was no force dynamic in the first place,
(b) the force, as indicated, was not in accordance with an appropriate representation as in [ex.9-11],
(c) evidential and discourse principles constrain the access and attribution of mental representation.

We can attribute the interpretation of Fluid verbs to the following principle: Fluid verbs are unspecified for the force dynamic; therefore, the presence of SET1 entails the force dynamic for a Fluid verb. In contrast, since Fluid verbs are unspecified for a force dynamic, SET2 with a Fluid verb is interpreted as lacking the force dynamic. This contrasts with Control verbs, where SET2 inflection is interpreted, not as a lack of force, but rather as a lack of appropriate representation.

4.0 INTENTIONAL ACTION AS MENTAL REPRESENTATION.

The suggestion thus far is that SET1/SET2 inflectional forms index the relationship between what the actor was aware of, or had in mind, and what the clause, or more specifically, the predicate phrase (VP) characterizes as the force dynamic and action sequence. The grammar of Newari provides further evidence for how the actor’s mental representation might be
characterized semantically. The data come from a complement structure in which a form of reported speech is used to express what me might call "premeditated action".

Consider first the contrast between SET1 and SET2 Non-past (NPST) forms in [ex.19-20]. The distribution of the SET1/SET2 forms in the Non-Past is identical to the distributions we have observed thus far.

(19) jī: la nO-e
1ERG meat eat-NPST/SET1
"I'll eat meat."

(20) wō: la nO-i
3ERG meat eat-NPST/SET2
"He/she will eat meat."

The SET1 form may also be used logophorically, as in the contrast [ex.21-22] in the reported speech below, with the hearsay evidential hŌ.

(21) wō: la nO-e hŌ
3ERG meat eat-NPST/SET1 it's.said
"(He,) said he, will eat meat."

(22) wō: la nO-i hŌ
3ERG meat eat-NPST/SET2 it's.said
"(Someone,) said that he, will eat meat."

The logophoric function also occurs with complements of the verb dhQ- 'speak, say'. The form dhOka: is a causative form grammaticalized as a complementizer.

(23) jī: la nO-e dhOka: dhOy-a
1ERG meat eat-NPST/SET1 COMP say-SET1
"I said that I'll eat meat."

(24) wō: la nO-e dhOka: dhal-O
3ERG meat eat-NPST/SET1 COMP say-SET2
"He, said that he, will eat meat."

(25) wō: la nO-i dhOka: dhal-O
3ERG meat eat-NPST/SET2 COMP say-SET2
"He, said that he, will eat meat."
Constructions with cognition verbs as in [ex.26-27] below are isomorphic with the complement structure for reported speech as in [ex.23-25] above.

(26) ği: la no-e dhOka: siu:  
1ERG meat eat-NPST/SET1 COMP know-IMPERF/SET2  
"I know that I’ll eat meat."

(27) wō: la no-e dhOka: siu:  
3ERG meat eat-NPST/SET1 COMP know-IMPERF/SET2  
"He knows that he’ll eat meat."

The complementation structure can also be used for clauses which express a causal relation between a thought and a subsequent action as in [ex.28] below.

(28) ji-tO da-i dhOka: bisyū won-a  
1-DAT hit-NPST/SET2 COMP flee go-PST/SET1  
"(I) fled thinking (he) will beat me."

When the main and complement clause subjects are coreferential, the structure can be used to indicate purpose. In other words, the plan of action is represented as thought or "inner speech".

(29) wo-yatO da-e dhOka: won-a  
3-DAT beat-NPST/SET1 COMP go-SET1  
"(I) went thinking (I) will hit him."

(30) ji-tO da-e dhOka: wol-O  
3-DAT beat-NPST/SET1 COMP come-SET2  
"(He,) came thinking (he,) will hit me."

Finally, the logophoric marking in the complement clause is also found in a complementation pattern indicating "premeditation".

(31) ği: la no-e dhOka: noy-a  
1ERG meat eat-NPST/SET1 COMP eat-SET1  
"I ate meat (thinking > intending) to eat meat."

(32) wō: la no-e dhOka: no1-O  
3ERG meat eat-NPST/SET1 COMP eat-SET2  
"He ate meat (thinking > intending) to eat meat."
The isomorphism in [ex.24-32] suggests a unified schema for the characterization of reported speech and mental representations. The specific properties of the schema which lead to the interpretation of premeditated action are given below:

1) There is a self-initiated force dynamic,

2) There is a mentally represented action plan expressed in a complementation structure isomorphic with quoted speech complements; the action itself is expressed in the main clause.

3) The predicate phrase (VP) of the main clause, which characterizes the action, must be equivalent to the predicate phrase (VP) in the complement clause, which characterizes the mental representation. In other words, the action must be in accordance with the represented plan of action.

4) The subject of the complement and main verbs must be coreferential. In short, one can only intend with respect to one’s own behavior and the direct attribution of intentional action is subject to the evidential and logophoric constraints.

5.0 CONCLUSION.

In conclusion, the distribution of SET1/SET2 inflection in Newari suggests a construal of intentional action consisting of a self-initiated movement in accordance with a plan or mental representation. By linking the force dynamic and representational domains with a set of lexical and discourse-pragmatic principles, we can characterize both the conceptual structure of intentional action, and how it may be attributed to individuals in situated interaction.

NOTES

REFERENCES


A Cognitive Grammar Approach to Perfect Aspect:
Evidence from Chinese
Yuchau E. Hsiao
University of California, San Diego

Langacker (1987) suggests that units of grammar are held to be symbolic, or bipolar, consisting of a phonological pole and a semantic pole. An expression's semantic pole is referred to as a predication, which always has a certain scope, and within that scope it selects a specific substructure for designation. The scope of predication is referred as the base, and the designated prominent substructure is called the profile. The theoretical framework which facilitates those concepts is well-known as Cognitive Grammar. This paper examines Chinese perfect aspect using a Cognitive Grammar perspective, which is of interest in that this language is enriched with aspect marking but displays no explicit tense. Before the discussion unfolds, some relevant notions in Cognitive Grammar should be elaborated upon.

The Base and the Profile

(1) to (3) illustrate three basic types of predication, namely a thing, a relation, and a process: (tr = trajector; lm = landmark; CT = conceived time)

(1) Thing

(2) Relation

(3) Process

In each of these three rectangles, all the elements together constitute a scope of predication, that is to say, the base. The boldfaced elements indicate the prominence of the designated substructure, namely the profile. A thing is a nominal predication, designating a region in some domain, as represented by
the boldfaced circle in (1). A relation then profiles the interconnections between participants, the most prominent of which are called the trajector (tr) and the landmark (lm), as in (2). Due to the fact that Langacker views the conceived entities and their interconnections as being conceptually dependent, he defines relations such that the entities are profiled as well as the connections. I have not placed the trajector and the landmark in boldface in (2) because I want only to emphasize the connection itself. The trajector is the entity which is evaluated or accessed, and the landmark provides a reference point with respect to the trajector. An atemporal relation may refer to the predications of A, ADV, P and the like. As for a process, it profiles a continuous sequence of stages through conceived time, as in (3). The right-headed arrow represents conceived time, and the symbol above simplifies a series of states of the activities between the trajector and the landmark. A process thus usually refers to the predication of V (cf. also Langacker 1982,1985,1988,1990; Hsiao 1990). Given the distinction between the base and the profile, we can now take a look at how the markers of perfect aspect profile.

The Complete Process Perfect Marker

Basically, Chinese perfect refers to the le construction. The prototypical designation of le (Hsiao 1990) is the completed aspect of a transition from an old state to a new state. In the most common cases, the transition may be identified with the complete process predicated by the relevant verb. In (4), the innermost square of the complete process le (leC) is elaborated by the verb component, shown by the dashed arrow, and the process predicated by the verb is viewed as a single whole, all stages of which are profiled, as they are boldfaced. (5) gives a more visualized picture of the transition, which is represented by the boldfaced arc. The level dashed line on the right represents the post-process new state, while the continuous line on the left represents the pre-process old state. (RP = reference point; T = Transition; P = Process)

(4)

(5)
The *le* construction indicates a sense of the transition being completed. The verbs which can take *le* \(^C\) include most action or activity verbs as well as some emotive verbs. (6-10) illustrate this:

(6) Na zhi lyu gangcai ti *le* \(^C\) Husen de pigu.  
That CL donkey just kick PRF Hussein GEN hip  
'That donkey has just kicked Hussein's hip.'

(7) Wo nyuer da *le* \(^C\) Gebachifu yi ji erguang.  
My daughter slap PRF Gorbachev one CL ear  
'My daughter has slapped Gorbachev on the ear.'

(8) Zhe shi Buxi yoyu *le* \(^C\) hen jiu.  
This matter Bush hesitate PRF very long  
'Bush has hesitated over this matter for a long time.'

(9) Minzhu dangyuan xiang *le* \(^C\) xuduo shi.  
Democratic member think PRF many thing  
'The Democrats have thought through many things.'

In the examples above, the profiled transition is equated with the whole process of 'biting' in (6), the whole process of 'slapping' in (7), the whole process of 'hesitating' in (8), and the whole process of 'thinking' in (9).

The Terminative Perfect Marker

There are verbs which intrinsically profile only the last few stages of a process, and which are usually followed by the second type of *le*, i.e., the terminative *le* (*le*\(^T\)), as shown by (11-14):

(10) Husen dao-guang *le*\(^T\) Keweite de shiyou.  
Hussein pour-up PRF Kuwait GEN oil  
'Hussein has drained Kuwait's oil.'

(11) Bai Gong guan-shang *le*\(^T\) heping zhi men  
White House close-up PRF peace GEN door  
'The White House has closed up the door of peace.'

(12) Meiguo jundui dao *le*\(^T\) Puosi Wan  
America army arrive PRF Persian Gulf  
'The American army has arrived in the Persian Gulf.'

(13) Yue-zhan ting *le*\(^T\) duo-jiu?  
Vietnam-war stop PRF how-long  
'How long has it been since the Vietnam War was over?'

The *le* component in (14) thus shows that the terminative *le* profiles a transition out of the process predicated by the verb, and in (15), the
noteworthy old state, represented by the left upper line, is actually the continuous sequence of states in this process before the profiled termination, represented by the boldfaced arc. The \( le^T \) construction conveys that a process is ended, and the endpoint of the final transition constitutes a noteworthy new state, represented by the lower dashed line on the right.

\[
\begin{array}{c}
\text{(14)} \\
\begin{array}{c}
\begin{array}{c}
\text{V} \\
\text{Le}^T
\end{array}
\end{array}
\end{array}
\]

\[
\begin{array}{c}
\text{(15)} \\
\begin{array}{c}
\begin{array}{c}
\text{Ongoing P} \\
T \\
\text{Post-P} \\
\text{Le}^T
\end{array}
\end{array}
\end{array}
\]

**The Inchoative Perfect Marker**

In contrast to the verbs in (10-13), those in (17-20), which are subject to the third type of \( le \), the inchoative \( le \ (le^I) \), designate only the initial stages of a process.

(17). Zhangsheng ru lei ban xiang \( le^I \) qilai
   "Applause as thunder like resound PRF up"
   'The applause has begun to resound like thunder.'

(18). Niaor chang-chu \( le^I \) meimiao de ge-heng.
      Bird sing-out PRF beautiful GEN singing-voice
      'The birds have begun to sing with beautiful voice.'

(19). Xianzai wo eh \( le^I \).
      now I hungry PRF
      'I have begun to feel hungry now.'

(20). Yezi hong \( le^I \).
      Leaf red PRF
      'The leaves have begun to turn red.'
In (17-20), \( Le^l \) indicates the inception of a new state, that is to say, it profiles a transition into the relevant process, as structurally represented by the verb component in (21). (22) then shows that the pre-process state goes through an inchoative drift and enters a state in the course of occurring. The noteworthy new state is a sequence of stages of the ongoing process.

The Accepted Reality Perfect Marker

Having established the multifaceted nature of the perfect marker, I will now show how the usage of \( le \) discussed so far can be accommodated through semantic extension, but before I go any further, let me briefly introduce a verbal variant of \( le \), namely, \( liao \):

(23). Bi li \( liao^A \) zhi.
Use up strength accomplish it
'(He) tries his best to accomplish it.' (Fu Zhai Ri Ji)

(24). Yan-jian de mei ge \( liao^U \) shi de ren song qu.
Eye-see to not CL understand matter DE person deliver go.
'(We) see no one who understands this matter who can deliver it.'
(Shui Hu Zhan)

There are two meanings of the verb \( liao \). In (23) the first type of \( liao \) means 'accomplish', and in (24) the second type of \( liao \) means 'understand'. Notice that the meaning of 'understand' implies some kind of mental accomplishment, therefore it appears that \( liao^U \) is an abstract version of \( liao^A \). It is on the basis of this idea about abstract development that I would like to propose the fourth type of \( le \), which I will call the accepted reality \( le \) (\( le^R \)). The previous three variants of \( le \) are verb-final, while \( le^R \) is a clause-final marker. In the following discussions, I would like to suggest that this clause-
final $le^R$ is an abstract version of the verb-final ones. Compare figures (25) and (26): (CT = conceived time; PT: processing time)

(25)

\[
\begin{array}{c}
\text{CT} \\
\text{RP} \\
\text{Base}
\end{array}
\]

$Le^C$, $Le^T$, $Le^I$

(26)

\[
\begin{array}{c}
\text{Accepted Reality} \\
\text{Base}
\end{array}
\]

$Le^R$

X in (25) and $X'$ in (26) represent the relevant process, while $Y$ and $Y'$ represent the transition profiled or presupposed by $le$. The notion of a transition can be construed abstractly as a completed journey along a mental path. The idea of the mental path can come to represent the progression of the speaker or conceptualizer's thoughts. In (26) the two dashed circles, which indicate the domain of accepted reality, or subjective reality, show two
subsequent states of the speaker’s processing thoughts. In the second state, that is, the second circle, the process X’ goes through a transition into the domain of accepted reality. The $le^R$ construction is then used with assertions to indicate the speaker’s having definitely arrived at the conclusion and subjectively regarding the fact as having been established. In other words, given the structure of $\{\ldots\} + le^R$, it indicates the meaning of ‘$\{\ldots\}$ has been established as a fact’, as exemplified by (27-30):

(27). \{Wo laopuo yo xiang sheng haizi\} le^R.  
    My wife again think birth child PRF  
    ‘(The fact is that) {my wife is, again, thinking of having a baby}.’

(28). \{Wo du bu wan zhe ben shu\} le^R.  
    I read not finish this CL book PRF  
    ‘(The fact is that) {I can’t finish reading this book}.’

(29). \{Chuang tai xiao\} le^R.  
    Bed too small PRF  
    ‘(The fact is that) {the bed is too small}.’

(30). \{Ni zhe ge ren zui huai\} le^R.  
    You this CL person most bad PRF  
    ‘(The fact is that) {you, this person, are the worst}.’

The parenthesized explanations are not meant to be direct translations of $le^R$, but they simply serve to spell out the idea of the abstract transition Y’ in (26). Notice that unlike Y in (25), Y’ in (26) is not boldfaced, that is, not profiled, but only presupposed as part of the base; the events in the curly brackets $\{\ldots\}$ are accepted in reality only abstractly and subjectively. In other words, the accomplished aspect of the Y’ transition in $le^R$ is not as perceptible as the accomplished aspect of the Y transition designated by the other three types of $le$. This seems to represent a case of semantic bleaching from the core meaning of the perfect aspect, and it is why previous linguists tend to classify the clause-final $le$ as an unrelated category. It has been observed that the distinction between $le^R$ and the other three types of $le$ is not always clear-cut, in particular when they all occur clause-finally, as in (31-33):

(31) Yifu wo xi le.  
    Clothes I wash PRF  
    ‘I have washed the clothes.’ ($le^C$)  
    ‘(The fact is that) {I did wash the clothes}.’ ($le^R$)

(32) Xinniang si le.  
    Bride die PRF  
    ‘The bride has died.’ ($le^T$)  
    ‘(The fact is that) {the bride died}.’ ($le^R$)
(33) Wo eh le.
   I hungry PRF
   'I have begun feel hungry.' (le)
   '(The fact is that) {I am hungry}.' (le²)

Each of the sentences presented above may have two interpretations (for more information, cf. Hsiao 1990).

**Time Reference and Current Relevance**

Unlike English, the reference point in the le construction is not grounded by tense. The sentences in (34) through (36) constitute evidence against any approach which imposes the function of tense-marking on le. For example, Li and Cheng (1984) propose the category of the "emphatic le" and consider it to be a past-tense marker. In their analysis, the "emphatic le" can only occur with a past reference point (or "narrative time," in their terms), and this category of le is emphatic because its presence or absence does not affect the meaning of a sentence.

(34) Mugian ta yi dao le shi bu zhang.
   Presently he already direct PRF ten CL war
   'He has directed ten movies up to now.' (Present)

(35) Qunian Buxi da le shi chang zhang.
   Last night Bush fight PRF ten CL war
   'Bush (had) fought two wars during last year.' (Past)

(36) Yi xiaoshi hou, wo jiu yi xie-wan le zhege jyuben
   One hour later I then already write-up PRF this film script
   'In an hour, I will have finished writing this film script.' (Future)

The inadequacy of this observation is self-evident in (34-36), which show that le regularly occurs at different temporal locations. It is clear that le does not situate the process at a particular point in time, but rather what it signals is precisely that a process is completed prior to a reference point, which could be in the past, the present or the future.

In general, perfect aspect markers profile an atemporal relation between a process predicated by the verb, and a reference time point with respect to this process (Anderson 1982; Chatterjee 1982; Tung 1982,1985; Langacker 1982,1990; Hsiao 1990). In other words, the process stands out as the trajector, and the reference time point serves as the landmark. Take for example (37-39), which are structurally depicted in (40-42):
(37)a. The bride has died.
   b. The new semester has started.
   c. I had kissed Lisa four times over the last week.

(38)a. The bride died.
   b. The new semester started.
   c. I kissed Lisa four times last week.

(39)a. Xinniang si le.
       Bride die PRF
   b. Xin xueqi kaishi le.
       New semester start PRF
   c. Shang xingqi wo qin le Lisa si ci.
       Last week I kiss PRF Lisa four time

(40) English Perfect

(41) English Simple Past
(37a) may suggest that at the time of the reference point the body of the bride is still warm, (37b) that somebody’s mind is still on vacation, and (37c) that Lisa was still willing. In any case, a current relevance of the process to the reference point is profiled in the uses of English perfect, shown by the boldfaced dashed line in (40). The simple past tense in English, on the other hand, shows no such current relevance but simply grounds the process at a time point in the past, as in (41). (38a) may refer merely to the bride’s death once upon a time, (38b) merely to an item on an academic schedule, and (38c) merely to the occurrences of the ‘kissing’ process. Consider now the Chinese sentences (39a-c). What is of interest here is that these sentences could either have the English translations in (37) or have the English translations in (38). The reason for these alternative readings is that although the Chinese perfect uses an atemporal relation in its base, connecting the process to a reference point of current relevance, it actually profiles the process but not the atemporal relation it self, as shown in (42), where the oblique dashed line is not boldfaced. In other words, the current relevance in Chinese perfect is not as prominent as in English perfect, but it is not precluded as in English simple past.

A final remark on the concept of current relevance leads to a little comparison of le and guo. Li & Thompson (1981) call the latter an experiential marker. The first distinction between the two is that the le construction usually profiles only one process occurring prior to the reference point, while the guo construction profiles one or more occurrences of the same type of process. Take (43) and (44), for example:

(43) Wo tingshuo Meiguoxiaojie yijing jie le hun.
I hear America Miss already get PRF marry
'I heard that Miss America has already gotten married.'

(44) Wo tingshuo Meiguoxiaojie yijing jie guo hun.
I hear America Miss already get PRF marry
'I heard that Miss America has already gotten married before.'
The *le* construction in (43) implies that the speaker is concerned with Miss America’s most recent marriage; it is not important whether she had ever been married before that. The *guo* construction in (44), on the other hand, conveys that Miss America has been married several times. A second distinction between *le* and *guo* in terms of the current relevance is that the use of *le* may indicate continuation of the post-transition state through a reference point, whereas, in the case of *guo*, the new state is discontinued. Consider (45) through (48):

(45) Meiguo zongtong dao *le* Sulian.
    America president arrive PRF Russia
    'The president of America has arrived in Russia.'

(46) Meiguo zongtong dao *guo* Sulian.
    America president arrive EXP Russia
    'The president of America has been in Russia before.'

(47) Yiezi hong *le*.
    leaf red PRF
    'The leaves have turned red.'

(48) Yiezi hong *guo*.
    leaf red EXP
    'The leaves had been red before.'

(45) and (47) say that the President’s arrival and the leaves’ being red continue to last through the reference point. (46) and (48), on the other hand, give an impression that earlier occurrences of the President being in Russia and the leaves being red have been discontinued some time before the current events have begun. In other words, *guo* suggests that something did happen but it might no longer be in effect.

In brief, I have shown that the *le* form appears invariant in spite of different time specifications, and thus does not function as a grounding predication. Our evidence also suggests that the *le*-marking presupposes a prototypical ‘transition’ between atemporal states, which may be identified with the complete process predicated by the relevant verb, or with the beginning or the end of the process. In addition, I propose the notion of accepted reality to argue that both the verb-final *le* and the clause-final *le* are in fact variants constituting a polysemous category reflecting a set of family linked semantics.

References


Dispersed Verbal Predicates in Vernacular Written Narrative

Paul J. Hopper
Carnegie Mellon University

1. Introduction

Most of the current literature on the notion of 'event' assumes some kind of *a priori* status for events, and takes it for granted that an event is a logico-semantic category that is reflected in sentences of a particular form, implicitly distinguishing between an Event and the report of that Event. Thus Parsons (1990:ix) summarizes a standard view: "The theory under investigation attributes to ordinary sentences of English (such as *Brutus stabbed Caesar*) logical forms that quantify over events." I will be concerned with the discourse uses of these 'ordinary sentences of English' in which there is a subject, an object, and a simple transitive verb, and with the problems posed by the view that a de-contextualized notion of 'event' underlies certain de-contextualized 'sentences'.

That transitive sentences with lexical nouns in subject position almost never occur has been pointed out before (e.g., Lambrecht 1987). In this paper it is suggested that the single word transitive verb that figures so prominently in logical and semantic treatments of eventhood is also relegatable to specific kinds of contexts when real linguistic data are considered.

2. Data

The document that I am examining is a representative example of a genre that is widely found in English. I refer to this genre as 'vernacular written narrative'. The adjective 'vernacular' is meant to suggest that it is the kind of narrative that does not usually find its way into print, and is not held up as a model of prose to be imitated. It is invariably told from a first-person perspective, and is the genre of personal letters, diaries, duplicated holiday newsletters, private journals, and other informal narrative intended for a limited circulation. Vernacular written narrative is neither strictly oral nor strictly written; instead it contains those features of 'involvement' and 'integration' (Tannen 1985) that cross-cut the oral/written dichotomy.

The example in focus here is a journal written by Col. Franklin H. "Pappy" Colby, USAAF, based on diaries kept by him during the spring, summer, and fall of 1943. The journal describes Colby's bombing 'missions' over Europe. It was written for circulation to family members and members of his own squadron, ostensibly to form a sort of official history of the squadron during this period of the air war. The document was typewritten by Col. Colby at some time during the 1980's, and the typescript (consisting of 40 pages) was distributed by xeroxing; there are probably a couple of dozen copies in existence. A pioneer aviator, Colby graduated from high school but had no college. His nickname "Pappy" was owed to his seniority (in 1943 he was the oldest active pilot in the Bomber Command.) He died in 1990 at the age of 89, and was buried at Arlington National Cemetery.

3. The Language of the Text

As an initial pass, let us consider the following passage from the journal. The page reference at the end of each citation is from Colby (No Date).
"With no diversion at all we head straight in to the target. At the IP (initial point) we are supposed to meet our supporting fighters, but we are twenty minutes late. Finally we see about thirty fighters at two o'clock, and I heave a sigh of relief that our friends have waited for us. Suddenly they attack, and at about the same time heavy flak starts exploding dead ahead. We take violent evasive action, and I am so busy for a few minutes that I don't see much of what is happening. Then I discover that the leading three ship element of our low squadron has drifted left out of the group formation, and I have to quickly decide whether to stay with the group or follow him. I decide to stay with the group, and it's lucky I do, because flak starts exploding right behind him where we would have been." (10)

3.1 MAVE's (Multiply Articulated Verbal Expressions).

In this passage we find examples of simple intransitive verbs, e.g., *Suddenly they attack*. In addition there are a few examples of single word transitive verbs, such as *see, discover, heave*.

Simple verbs like *attack, discover, and see* in these examples, whether transitive or intransitive, are in fact relatively rare in the text. Instead the dominant mode of narrating is through what I will call *multiply articulated verbal expressions*, MAVE's. Examples of MAVE's in the passage cited are:

- head straight in
- are supposed to meet
- heave a sigh of relief
- starts exploding (x2)
- take violent evasive action
- has drifted left
- have to quickly decide
- decide to stay

The MAVE is a persistent and dominant characteristic of English vernacular prose writing. (I suspect that it will also turn out to be a significant component of Spoken English.) Instead of presenting an account through a single, semantically rich verb form, the writer distributes verbal elements over an extended phrase or even over more than one clause, no one part of which exhaustively defines the 'verb'. MAVE's appear in numerous forms, of which only a few can be mentioned here - enough, I hope, to allow the type to be recognized.

The more obvious examples of MAVE's are characterized by a finite verb drawn from a small repertoire, such as *have, take, start, decide*, etc., together with amplifying elements that may be short adverbs and particles, infinitives and -ing participles. Through MAVE's, verbal meanings are dispersed over several words. This dispersal is accomplished in a variety of ways, but the net effect is always the same, an avoidance of predicates of the type V(O), where V is a single word verb and O is a direct object referent.

In what follows (3.2) I list and discuss some of the types of MAVE that I have observed in the text.
3.2 Kinds of MAVE.

3.2.1 MAVE's and Modal and Other Aspectual Auxiliaries.
The most familiar class of MAVE is that consisting of the elements of the Verb Phrase in standard descriptions. These elements include maximally: a primary tense morpheme; a modal auxiliary; have+en; and be+ing. There are numerous examples in the text:

<2> "I had noticed a big pile of waste lumber" (2)
<3> "We wondered how an enemy fighter could survive" (7)

3.2.2 Other auxiliary expressions.
It is widely recognized that in addition to these well-known auxiliary elements, English is richly endowed with complement-taking verbs that because of their frequency and partly grammaticalized structure could be called near- auxiliaries. Consider for example some typical narrative clauses such as the following:

<4> "I keep on going straight ahead" (16)
<5> "By this time some 20 or 30 enemy fighters were getting set to attack" (37)
<6> "I was just beginning to get acquainted" (2)
<7> "Our right landing wheel refuses to lower" (27)

There are numerous auxiliary expressions of this kind; some of the more commonly used ones found in the text are listed:

**Group I**
- try to V
- hope to V
- remember V-ing
- keep V-ing
- keep on V-ing
- continue V-ing
- begin to V
- begin V-ing
- manage to V
- decide to V
- start to V
- start V-ing
- dare V
- let V
- intend to V
- refuse to V

The verbal element labeled V in such expressions is usually intransitive, and, as these examples suggest, the overall aspectual meaning is often a prospective or inceptive of some kind. In addition to these more obvious auxiliary-like expressions, there are hosts of other expressions, for the most part consisting of more than one word, that support a verb and look more like improvised collocations, in that many of them occur only once or twice in the text. Some examples of this second group follow:

**Group II**
- be surprised to V
- pick this time to V
- be [so] busy V-ing
- scramble to V
- be about to V
- be supposed to V
- take steps to V
- bugger around V-ing
- hustle to V
- move to V
succeed in V-ing
see NP V-ing
wind up V-ing
go to all the trouble of V-ing
never do V
happen to V

hear NP V-ing
be of the assumption S
come V-ing
have a hard time V-ing
wander around V-ing
turn out to V

There is no sharp dividing line of a structural or a functional sort between groups I and II. Some of them are clearly favorites of Col. Colby, e.g., the ironic *pick this time to V*, which occurs several times, and *turn out to* (as in "they turned out to be the combined remains of the 94th and the Composite Group" [17]). This latter expression is a frequent strategy for narrating events or states of affairs not witnessed at the time by Colby, but learned subsequently.

3.2.3 **Manipulative and Causative Expressions.**
Another common class of expressions that can be counted as MAVE's is that consisting of a verb, usually passive, suggesting that the subject is not directly agentive, but is responding to some kind of coercion. The military context of course is conducive to the use of such verbs. Among them are:

be ordered to
be briefed to
be scheduled to
be talked into (also active: talk NP into)
be told to
be asked to

3.2.4 **Anacrustic Coordinated Clauses.**
Clauses that are coordinated with and may be of equal importance, e.g.,

<8> "I'm flying behind the high squadron with Morrill as co-pilot, and we go out over the Channel, drop our practise bombs, and let down to 8,000 ft headed for home." (31)

However, it often happens that of two coordinated clauses the first is not an independent contribution to the narrative, as it is in the above clause, but a semantically dependent preparation for the second clause. There are many examples, e.g.

<9> "I finally woke up and remembered the procedures." (6)
<10> "Shortly after crossing the French coast we took a chance and dived down to join a lower group." (23)
<11> "Nothing to do but sit around on our fannies and wait, hoping we'll get home for Christmas." (39)

*Wake up and, sit around on our fannies and, and take a chance and* are 'in anacrusis' to the second clause. ('Anacrusis', and the adjective 'anacrustic', normally refer to an anticipatory unstressed syllable preceding the main ictus in a foot; I here extend the term to full clauses.) Clauses are identified as anacrustic in this sense on several grounds: (i) No independent assertion seems to be intended, (ii) The anacrustic clause is a recognizable ('slang') collocation, and (iii) The
anacrustic clause is typically not meant literally. Thus in <9> woke up and remembered is a single assertion; in <10> take a chance and is a recognized English expression; in <11> they no doubt did many other things than 'sit around' while waiting; and so on. In the next example, however:

<12> "so we speeded up and joined a group ahead of us for mutual protection" (19)

speeded up and was not counted as anacrustic, since (i) a separate assertion of speeding up is clearly intended, (ii) speed up and is not regularly collocated with a following coordinate clause, and (iii) speed up itself is meant literally.

3.2.5 'Basic English' verbs with nominals.

A favorite kind of MAVE is that in which a verb is combined with a nominal of some kind to form a composite verbal expression. Typical examples are: made a rear attack, and made a pass over. In such MAVE's the verb is superficially transitive, in the narrow sense of having a grammatical object. However, this object is usually non-referential and semantically cognate with the verb. Moreover the object is almost always a deverbal nominal of some kind, such as attack, pass, decision, etc. The object is in other words not a participant in the discourse. Quite often the entire expression is idiomatic, and should probably be regarded as lexical, e.g., take steps to, make the swap, etc.

The verb itself is one of a very small group of 'Basic English' verbs that includes make, do, take, get, give, have, and put. Examples of this construction occur with great frequency, often with several on one page, so many in fact that MAVE's constructed with it constitute a favored type of predicate. A selection of examples follows:

**Make**
- made a rear attack
- made a pass over
- made the swap
- made a fast decision to
- made a turn
- made every effort
- made a run on

**Do**
- do [our own] aiming
- do a fine job + V-ing do a feint

**Give**
- give protection
- give [us] a going over

**Get**
- get a [brief] glimpse of

**Take**
- take evasive action
- take a chance
- take steps to
- take the lead
- take the lead
- take one horrified look

**Put**
- put in a bind

**Have**
- have the privilege of

The selection is representative of the text in that the most frequent verbs are *take* and *make*. 
3.2.6 Phrasal Verbs.
Perhaps the most profusely represented type of MAVE in the text is that consisting of a verb with an adverbial particle, such as come back, warm up, etc. Such 'phrasal verbs' are of course a well known phenomenon of English; but they have almost always been dealt with from the point of view of their syntax and semantic collocations, and have rarely been considered from the perspective of their discourse roles. In the 40 pages of text there are in the order of 500 such verbs, that is, more than ten per page. A number of these are clearly lexical, that is, they have a special meaning and are strictly collocated, for example bail out ('parachute'), spin in (i.e., 'spin down into the sea'), wind up (followed by V+ing); in these the verb occurs always and only with a specific particle. Other collocations occur with a common verb, e.g., take off, break out, but with specific meanings (take off = 'leave the ground'; break out = 'come out from a cloud'). In other cases the verb and the particle are more or less freely combined, e.g., come out, come in, come off, come out, etc.

In the text a large majority of these verb + particle clauses are intransitive, and the aspect is almost always perfective. The particle in fact often supplies what might be understood as a perfective meaning to the verb (stand vs stand up, etc.) However, the particle usually does more than add perfectivity to the verb. It almost always indicates a deictic perspective on the action, and thus is implicated in the general perspectival envelopment of the action that is the most striking feature of MAVE's.

3.2.7 Adverbs.
Another way in which verbal expressions are strung out and linearized is through adverbs and adverbial phrases:

<12> "I keep on going straight ahead" (16)
<13> "I finally figure it out to be moonlight" (5)
<14> "when they dug it they just happened to throw the dirt out on the airdrome side of the ditch." (23)
<15> "Then I discover that the leading three ship element of our low squadron has drifted left out of the group formation" (10)

Although the number of such adverbs might appear to be large, it is nonetheless a closed list; all those mentioned below appear more than once. They are usually positioned adjacent to the inflected verb, adding to it one of the recognized aspects meanings. They are included in the verbal expression by virtue of their meanings (aspectual) and their position (adjacent to the verb or otherwise embedded in the verbal expression), and they add another element to the effect of dispersal in the verbal expression. A partial list of such adverbs includes the following:

- straight
- at last
- just
- immediately
- always
- now
- eventually
- really
- completely
- already
- home
- forever
- repeatedly
- finally
- yet
- quickly
- suddenly
- ever
3.2.8 **Collocations.**

Many, perhaps most, of the figures that have been catalogued above are collocations, that is, this particular combination of words is a habitual one. There are a few collocations involving a verb that do not fit naturally into any of the other sections, but can be said to form a functional unit of some kind. Some of them are superficially transitive, e.g., *saved our necks, cast a shadow*; as in the verb + nominal discussed above (3.2.5), the object in such expressions is nonreferential and is never a discourse participant. Examples:

- run late
- cast a shadow
- saved our necks
- go wrong
- rumor has it + S
- dipped their wings

3.2.9 **Motion Expressions.**

There are doubtless numerous other kinds of constructions that should be included as MAVE's, but the last one I shall discuss here consists of a small number of compound motion expressions that give the impression of a strung out, dispersed predicate that nonetheless constitutes a functional unity, e.g.,

- be on one's way
- be on the way [out]

3.3 **Transitivity and Event Marking.**

The examination of the MAVE suggests the broad conclusion that Col. Colby avoids narrating ordinary events in a simple transitive form. Yet he does not entirely avoid sentences containing simple transitive verbs, as is shown by examples like the following:

<16> "A grand guy, who had a very rough time on one of his missions, when a 20 mm shattered his cockpit and killed his co-pilot" (38)
<17> "I heard later that Col. Moore phoned Gen. Arnold in Washington" (4)
<18> "Thorup led the high squadron, with me leading the second element of three ships behind him." (9)
<19> "One ship lost their tail gunner, and we all had considerable flak damage." (11)
<20> "The formation was good, and the lead bombardier hit the target right on the nose." (12)

Some typical environments for simple transitive verbs emerge, however, which, when factored out, reinforce the hypothesis that to the extent a category of 'main line event' is identifiable such events tend not to be narrated with single-word transitive verbs. One such environment is subordinate clauses:

<21> "We do a feint at the enemy coast to fool the fighters" (13)
<22> "Right after leaving the target, the fighters come in thick" (15)
<23> "...just as we crossed the coast over Helgoland three fighters made a rear attack on me" (17)
Another environment in which simple transitive verbs frequently occur is a retrospective discourse environment in which events are being related from a distance. Consider examples like the following:

<24> "When we got home, we passed all our information on to the British Air Sea Rescue, and one of their 'Boston' aircraft sighted Thorup at 10:30 pm that night and signaled a nearby Motor Torpedo Boat on operations, who came over and rescued the boys." (18)
<25> "Kiel was covered with clouds again, so we bombed an industrial town southwest of it." (17)
<26> "The lead Wing kept going and bombed an airfield on the French coast" (29)

Transitive verbs here serve to compress complex events into short lengths of text. Almost always when a simple transitive verb is used in a main clause it is easy to infer that much 'local' detail has been omitted. Events are summarized and compacted, and it is this compacting which no doubt is conducive to there being two different participants (an agent and an object) in the same clause. By contrast, when events are being reported in detail - in close-up, so to speak - MAVE's are the rule, as is seen time and time again in passages like the following:

<27> "So we turn on the bomb run and suddenly find that the target instead of being dead ahead is off to our left some 30 miles. Nobody had any suggestions, so I told the bombardier to keep the target in sight and we would make a 180 degree left turn and bomb it on a westerly heading. We made a good bomb run, and the photos showed later we did a good job hitting it in spite of the problems... (etc.)" (26)

Along with the summarizing function of single-word transitive verbs there goes a tendency to find them in 'evidential' contexts, reporting events not actually witnessed by Col. Colby but filled in from the reports of third parties. It frequently, but not always, happens that such unwitnessed events are reported in subordinate clauses; but main clauses are also commonly used. A few examples:

<28> "The lead Wing kept going and bombed an airfield on the French coast" (29)
<29> "A grand guy, who had a very rough time on one of his missions, when a 20 mm shattered his cockpit and killed his co-pilot" (38)
<30> "A British Halifax bomber spotted them and radioed Air-Sea Rescue, who sent out a Lockheed Hudson, which dropped them a powered lifeboat. They sailed this boat some 120 miles, when they were picked up by a Danish fishing boat. The Danes brought them to England..." (26)

The reason for this is clear: only the author can vouch for narrative detail. Conversely, of course, fine detail is usually taken as evidence of an eye-witness report. Accounts attributed to other parties are presented as factual but remote and brief. They are bereft of narrative detail and of the first person voice, being typically reported in the third person.

In his own first person account, Col. Colby prefers to construct verbal expressions consisting of several words, none of which alone can be said to
report an event in abstraction from other perspectives on the event, and in which elements of aspect, viewpoint, deixis, evaluation, and epistemic status are combined as components of the event. Although these components are dispersed and linearized, they do not necessarily fall out as identifiable agglutinated elements, with a slot for each function; rather the effect is of a synthetic amalgamation of these components that is distributed more or less randomly over different words in the verbal expression.

When narrating events in which he is a participant, he rarely confines himself to an account of 'what happened', but records 'what happened' always in relationship to a perspective of some kind. The perspective on events reflected in MAVE's is a personal one, in which the very pretense at objectivity is itself part of the process of self-presentation. Consider the following examples:

<31> "Then the navigation went wrong, because instead of turning back some 60 or 70 miles west of the Frisian islands we went clear down on top of them and stirred up a hornet's nest of fighters." (25)
<32> "We have had a British Lysander aircraft sitting on our field, and I talked the crew chief into letting me fly it, on the basis I was an old RCAF pilot." (22)
<33> "I really tried to grease it in on the runway, for with ten 500 lb bombs on board it always scares hell out of us." (20)
<34> "The remains of the lead and low squadrons strung along with us, and we caught up with the group ahead, which turned out to be the 95th Battle Group." (19-20)

In <31> the consequences of a navigational blunder by the lead aircraft are underlined by 'went clear down on top of', and 'stirred up a hornet's nest of fighters', the precisely opposite effect to the intention of the manoeuvre. (Colby's tendency to blame others, and especially superiors, for disasters is frequently an implicit component of the verbal expression.) In <32> he underlines his privileged status in the eyes of the British as a former Royal Canadian Air Force flyer. In <33> he conveys the tenseness of having to land a large aircraft with a full load of bombs on board. In <34> MAVE's (string along with, catch up with, turn out to be) are used to identify and re-organize the remnants of the shattered formations from the perspective of Colby's own aircraft. In all three clauses of <34>, it is noticeable that the finite verbs alone (string, catch, turn) cannot be used to report the respective events.

4. Conclusions

The use of the favored kind of verbal predicate which I have called the MAVE has implications for both the grammar of English and for the status of presumed linguistic categories such as Event in general.

4.1 The Grammar of the Verbal Expression in Vernacular Written English.

If the notion of a lexical verb is equated with a single word, Vernacular Written English is clearly characterised by its very small number of different lexical verbs. This restriction is compensated for by a complex verbal expression I have referred to as the Multiply Articulated Verbal Expression (MAVE). MAVE's serve to disperse verbal ideas over several lexical units. The correlation of the lengthier MAVE's is iconic to close-up, detailed reports in the first person, and the shorter
single-word transitive verbs are iconic to distant, summarizing reports in the third person.

This dispersal of the verbal expression is not equivalent to 'linearizing' vertical semantic features of the verb, since the constituents of a MAVE will usually amount to far more than is implicit in any single item in the English lexicon of verbs, and in any case the individual constituent words of a MAVE do not necessarily reflect individual semantic features of verbs. For example, perfective aspect is often linked with deixis in adverbal particles; modality is often distributed over modal or modal-like verbs and epistemic adverbs; antecedent and prospective tenses are dispersed, the latter especially having a variety of different forms (get set to, be on the verge of, etc.) On the other hand, the present/past distinction in the verb is clearly no longer exclusively one of referential tense, but is used expressively in different narrative contexts in ways that suggest personal involvement (cf. Tannen 1985)

4.2 Constructing rather than Reporting Events.

Rather than assuming language that 'reports' events, it would be more appropriate to speak of the rhetorical construction of events through speech acts of narrating and reporting. (Fleischman 1990 is an important book-length exposition of this point.)

It is not that Col. Colby presents events from a certain perspective, but more the opposite: he does not so much report an event 'wie es eigentlich gewesen' ('as it really was' - to quote a 19th century positivist historian), as construct a persona for himself out of his memories of this event. It is not difficult to identify the socially imprinted source of this persona: the John Wayne of middle years, the Hollywood war hero, mature (the men under him are 'boys'), laconic, resourceful, rebellious. This John Wayne persona intervenes both chronologically and textually between Colby's experiences in 1943 and his narrative in the 1980's, and forces upon us the question of whether it is legitimate to posit "real" events as the grounding for the textual representations "of" the events. For there is no direct mimesis Event -> Report. Rather the event is wrapped in a cocoon of perspectives, ranging from subjective evaluative ones to 'epistemic' ones to quite conventional aspecual ones. Simple verbs are rarely adequate instruments for expressing such a range of simultaneous perspectives. We need to consider a wider verbal unit, for which I have suggested the MAVE. Moreover, when we strip away those components of events that are supposedly incidental or diacritic, expecting to find the 'event-in-itself' in the core, we typically find no single form that can be so identified. From this point of view the whole question of the 'grammatical coding of events' (the title of our parasession) is mis-stated, since it is not that grammar "codes" events but that both events and grammar emerge as secondary constructs from certain kinds of discourse (Hopper 1987, 1988).

4.3 The "Conceptual Autonomy" of Events.

The considerable amount of discussion about Events in philosophy and linguistics has focused largely on such questions as what events "are", for example whether they are semantic primes or constructed from more basic entities; for a recent discussion of these possibilities, see Parsons 1990:145-153. The data sources on which this discussion draws are invariably hypothetical, context-free sentences. What I have tried to show in this paper is that there is little correspondence between what people imagine they might say when reporting events (e.g., "Mary broke the window" [Parsons 1990:139]) and what they actually do
say in real narrative, and that the typical sentences held by philosophers and linguists to report events are, when real data are considered, restricted to highly specific narrative contexts.

This suggests that we can never start the analysis of events from what Parsons (1990:286) calls an 'empty file'. For the actual formulation of an event is never genre free or discourse free. We cannot actually 'narrate' an event in the abstract; abstract statements of events are not themselves reports, but are hypostasized from our experience of speech acts of actual narration. At some point, then, the abstract must be exemplified, and the exemplification must consist of words; but real words cannot be pried free of their discourse frames and genres and the personae of their author.

The transitive linguistic form assumed by a 'prototypical' or 'mentally represented' event (such as "Mary broke the window") is, not unexpectedly, the form suitable for events narrated at a distance, remote from the narrator, about third-person topics; and surely this remote narrative perspective is the model for abstractness, not the other way around. That is, if we indulge in the mental exercise of making up abstract events, or "prototypical" events, we instinctively formulate them as if they were distant and as if we were uninvolved, and we automatically factor out close-up, personalized detail. We thus implicitly endorse and privilege one particular kind of narrative reporting, the unwitnessed event.

Moreover the distance effect, because it compacts and reduces, is conducive to the inclusion of other participants in the event, and hence to transitivity. And finally, because the supposed prototype is at best 'reportorial' and not narrative, that is to say, it claims to typify a report of a single isolated event rather than to report an event embedded in personal narration, it is embodied in a particular form, the one appropriate to incidental (secondary) events.

The autonomous view of Event sees an event as an irreducible conceptual entity, or perhaps as a cluster of conceptual primes, rather than as a rhetorical construct that emerges out of speech acts of narration and is adapted to the perspectives and intentions of the narrator. The latter view of events has the methodological disadvantage that it requires access to and study of actual examples of narration. On the other hand it has the advantage of situating the notion of Event inextricably in the act of narration which is ultimately the only possible source and prototype for that notion.

Note

I would like to thank those who have heard or read earlier versions of this paper and commented on them: Polly Szatrowski, Philippa Benson, Dave Kaufer, Sandy Thompson, and Linda Flower.

References


My research interest is in the foundations of the human conceptual system, and not in linguistics or language acquisition per se. However, in my reading of cognitive linguistics, I have been struck by the affinity between the image-schemas that cognitive linguists have proposed for representing certain semantic categories and the kinds of concepts that my research (and that of other developmental psychologists) indicates are being formed in infancy. As a developmental psychologist I am interested in finding an appropriate representational format for the concepts that are developing before any language has been acquired. Whatever their format, these concepts will shortly be augmented by language learning, and both psychologists and linguists have a stake in accounting for how language is mapped into the existing conceptual system. What I would like to do here is to present some hypotheses about prelinguistic conceptual primitives and to illustrate how they can be related to the semantic and grammatical notions that cognitive linguists have described in image-schema terms.

To relate conceptual development to language acquisition is hardly a new endeavor, but it is a daunting task and it has been difficult to find clearcut relations between the two. In particular, I have been dubious about the use of various sensorimotor accomplishments as indicators of the kind of cognitive development that is related to language acquisition. Sensorimotor schemas, as these have been described by Piaget (e.g., 1952), consist of perceptual and motor procedures for taking in information and acting on the world. In the early months, according to Piaget, these procedures are used to parse the world into objects and simple events. In the second half of the first year, procedures develop for recognition and manipulation of objects. By the second year, these procedures have become greatly differentiated and are applied to increasingly broad and varied event-contexts. But whether in the first month or the twelfth, a sensorimotor procedure is not conceptual in nature. This is why Piaget stressed that the infant is not able to think about the world, to recall the past, or to anticipate in a conceptual way what might happen next. Sensorimotor procedures, for all their complexity, are relatively low-level devices. By definition they do not require conceptual (symbolic) understanding; they are pattern-matching and motor control devices. Such devices deal with complex, continuous, analog information and seem ill-suited for mapping into the quintessential symbolic system of language.

Language is unlikely to be mapped directly onto sensorimotor schemas. There is a missing link: a conceptual system that has already done some of the work required for a mapping to take place. One of the functions of this early conceptual system, I believe, is to redescribe sensorimotor information into a form that is more compatible with the mapping process; that is, it forms an interface between analog sensorimotor functioning and the discrete symbols of language (see Karmiloff-Smith, 1986, for a related point of view). To illustrate, it would be extraordinarily difficult to go directly from the continuously varying physical parameters of the movement involved in picking up one object and placing it in another to the statement, "The marble is put into the cup." Some kind of conceptual summary of what is happening in this situation is needed; it is this conceptual summary that is mapped, rather than the sensorimotor schemas themselves.

But there is a surprising omission in developmental theory at this point, namely, discussion of what this conceptual level of representation is like. Piaget, of
course, recognized the difference between sensorimotor and conceptual representation; indeed his distinction between the two forms of representation was a major contribution to our understanding of development. The mistake he made, in my opinion, was to assume that a conceptual form of representation was such a late development (Mandler, 1988). In any case, he did not have a lot to say about this new form of representation, other than that it was symbolic and was a transformed version of the earlier sensorimotor schemas. Later workers, such as Uzgiris and Hunt (1975), developed sensorimotor scales that more or less ignored the distinction, in the sense that these were ordinal scales that moved from testing what are clearly sensorimotor schemas in the earliest items to a variety of items at the top of the scale that seem to require conceptual thought. Much of the work that went into relating language acquisition to prior cognitive development used these scales or variants of them, without a clear analysis of which items reflect perceptual procedures and either simple or advanced motor skills and which reflect a conceptual form of representation; often items are merely described as Stage 5 items or Stage 6 items, without specifying more exactly their conceptual status. (There have been a few analyses along these lines, e.g., Gopnik and Meltzoff, 1987, but to my knowledge no attempt has been made to partial out the motor components from the conceptual components required by various items).

Developmental linguists, on the other hand, have addressed the issue of the kinds of concepts that must be represented at the onset of language acquisition, particularly the acquisition of grammar, primarily from the point of view of what is expressed in early language. I take it that a consensus has been reached that concepts of actionality, objecthood, and agency are representations required for learning grammar (see Maratsos, 1983). And by the second half of the second year, other concepts, such as possession, plurality, pastness, and a variety of relations such as support and containment must be present to account for the acquisition of the morphemes expressing these ideas (e.g., Brown, 1973). However, most of these concepts have not been clearly related to the various items on the sensorimotor scales.

It seems important, therefore, to look again at the genesis of the major concepts needed for language acquisition, and in particular to consider the prelinguistic format in which they are couched. Regardless of when in development one wishes to claim that conceptual representation has begun, one must face this issue. It is not sufficient merely to say that a sensorimotor schema has been transformed in some way and is now a concept. How does this happen and what is the resulting representation like? To my knowledge, Dan Slobin (1985) is one of the few people who have addressed the issue of the specific nature of prelinguistic representation. The ideas I am presenting here fit quite well with some of the work he has done, and both sets of ideas fit well with the work of cognitive linguists, such as Talmy and Lakoff.

Conceptual representation in preverbal infants

Before turning to the representational issue, I will briefly review the kinds of concepts that recent research suggests are present in the first year of life. Many of the notions that underlie language appear considerably earlier in infancy than Piagetian theory indicated. First, infants parse the world into coherent, bounded objects at least by 3 months and possibly earlier (e.g., Spelke, 1987). Thus, this particular sensorimotor achievement is quite early and possibly even innate.
Second, 3- to 4-month-olds understand that objects are permanent, in the sense that they expect objects to continue to exist when hidden; they also understand that objects are solid and cannot cohabit the same space (Baillargeon, in press). Various theorists in this area take these results to mean that central thought is already developing from the initial sensorimotor base (e.g., Leslie, 1988; Spelke, 1987). That is, at least some of the understanding involved in object permanence may be conceptual in nature rather than purely sensorimotor, even though it occurs early in infancy. Third, infants encode the causal relations that objects enter into as early as 4 to 6 months (Leslie, 1984; Leslie & Keeble, 1987). Although the extent to which this accomplishment, like that of understanding object permanence, is purely perceptual in character or involves conceptual thought is still unclear, it is clear that these kinds of information become available to the system very early and therefore are potentially available to be operated on. Fourth, infants have some understanding of containment relations by 5 to 6 months (Kolstad, 1991) and support relations by 8 months (Baillargeon & Hanko-Summers, 1990). Fifth, 9-month-old infants have also been shown to be able to recall something they have seen after a 24-hour delay (Meltzoff, 1988) and at least for short intervals at even younger ages (Baillargeon, in press). We have also found 24-hour recall of simple event sequences in 9-month-olds in our laboratory, and are just beginning to obtain data suggesting the ability to recall such events after a 2-month delay. The recall data are particularly important because the ability to bring to mind (re-present) absent objects or events is considered to be the hallmark of a conceptual system (e.g., Piaget, 1952).

The kinds of concepts I have just described are foundational in nature: concepts of what an object is, causality, support relations, and so forth. But there are other kinds of concepts that appear to develop in the first year that are more specific, and in some sense are closer to what we usually have in mind when we use the term "concept," namely, concepts about the kinds of objects and events there are in the world. In my laboratory we find that infants have begun to develop global concepts of animals and vehicles by 9 months of age (Mandler & McDonough, in preparation). One way we show the presence of such concepts is to hand infants little plastic models of a variety of animals to examine one at a time (e.g., a horse, a turtle, a bird, and a rabbit). Then we hand them a model of a vehicle. Infants will examine the vehicle for a longer period of time, indicating that it seems different to them. Similarly, if we give them a series of vehicles and then an animal, they examine the animal longer. Golinkoff and Halperin (1983) have also reported a concept of animal at 8 months of age, using a child's unique emotional response to a variety of toy and real animals of different sizes, shapes, and textures. Ross (1980) using a habituation-dishabituation technique similar to ours, showed the presence of animal, food, and furniture categories at 12 months. The exemplars of these categories were highly varied in their perceptual appearance.

Such global categories do not appear to be mere sensorimotor accomplishments. Forming perceptual categories of things that look alike can be accomplished by sensorimotor processes, but there is too much perceptual variation in the classes of animals, vehicles, food, and furniture to be easily accounted for on a purely perceptual basis. At the least, one would expect overall shape to play a major role in purely perceptually based categorization of objects. Yet, in our work, we find that 9-month-olds differentiate models of birds and airplanes, even when both have outstretched wings. That is, when we make overall shape as similar as possible, infants nevertheless do not confuse exemplars from the animal and vehicle domains. At the same time, our current data, (still in progress) also suggest that 9-month-olds are not making clear categorical distinctions between dogs and fish,
objects whose shape obviously varies a good deal. Perceptual categorization of
dogs and fish should be an easy sensorimotor task (e.g., Cohen & Younger,
1983). Therefore, the data suggest that performance on this object-examination task
is based on conceptual considerations, rather than on ability to perceptually
discriminate the categories involved. The data also suggest that infants of this age
have a global conception of animals, but one that is not yet well differentiated. This
view is in accordance with other data showing that 1- to 2-year-olds also
demonstrate global conceptions of animals, vehicles, and plants, often without
showing basic-level differentiation of these domains (Mandler, Bauer, &

As a result of these considerations I take as a working assumption that
preverbal infants have developed concepts of animals and vehicles, (and quite likely
concepts in other domains as well), and so we need to ask the basis on which such
concepts are formed and how they might be represented. I have suggested
(Mandler, 1988) that a conceptual system develops in parallel with the acquisition
of object and event schemas during the first year of life, rather than beginning as a
transformation of such schemas after a prolonged sensorimotor stage, as suggested
by Piagetian theory. I have proposed that the mechanism by which preverbal
concepts are formed is one of perceptual analysis. Perceptual analysis is an active
process whereby infants selectively attend to certain aspects of the objects and
events they are perceiving, and redescribe this information into a simplified format
that provides their meaning. In principle there is no reason why such redescriptions
cannot occur as soon as object and event perceptual schemas begin to be formed.
As I have already indicated, many such schemas are formed early in infancy, and
therefore, we should look for conceptualizations related to them at least as early as
five to six months.

**Image-schemas as a prelinguistic representational format**

The main issue I wish to address here is the format that might be used by a
preverbal infant to conceptualize what is being learned about the world. The format
should be one derivable from perceptual information, and one that does not require
detailed featural analysis. At the same time, the format should be appropriate for
later mapping into the propositional forms of language. It should be obvious from
this description that image-schemas as formulated by cognitive linguists fit the
requirements rather neatly (e.g., Johnson, 1987; Lakoff, 1987; Langacker, 1987).
Image-schemas are said to consist of mappings from spatial structure to conceptual
structure. The spatial structure that is used for the mapping consists of very general
aspects of the trajectories of objects and their interactions in space, ignoring most of
their details. The conceptual structure that results consists of the meanings of what
objects are and the kinds of events objects participate in.

From the point of view of a linguist, image-schemas are useful to represent
relationships among concepts expressed in language and to show how and why
words are imported from one domain to another (e.g., Fauconnier, 1985; Lakoff,
1987). From the point of view of a developmental psychologist, image-schemas
are also suitable as a representational format for an organism that is perceptually
sophisticated but as yet has no discrete vocabulary or other symbol system to
describe what it perceives. I propose that it is a capacity to summarize the spatial
structure it is encoding into a schematic form that allows the infant to develop
preliminary meanings of objects and events. These schematic sketches serve two
functions. First, they allow the formation of the concrete memory images that are used in recall. (I follow Piaget here in assuming that images are conceptually interpreted, not raw recreations of past perceptions). Second, they provide a conceptual format that allows further redescription, this time into language. Now, however, the material to be redescribed is easier to put into a propositional format than would be the case for uninterpreted perceptual schemas. For example, some contrasting image-schemas seem to provide an essentially binary distinction, as in the case of SELF-MOTION and CAUSED MOTION that I discuss below, and are therefore tailor-made to be "propositionalized." It may also be noted that image-schema redescription requires only perceptual experience; it does not require the physical manipulation of the environment that Piaget thought was necessary to transform sensorimotor schemas into thought. Skill in handling objects is a slow development in infancy and one that may have misled us about the conceptual accomplishments that are taking place.

Thus, I am proposing a three-tier architecture that develops during infancy: perceptual (sensorimotor) procedures used to recognize objects and events, redescriptions of the information so encoded into image-schemas, followed by further redescription of the image-schemas into language. The mapping of objects and events into image-schemas involves the loss of detailed information but preserves selected aspects of their spatial structure. The simplified, but still analog, schemas that result constitute the essence of the prelinguistic understanding of objects and events. The mapping of spatial structure into image-schematic form does not seem like an unduly difficult processing task; indeed, I understand that Lakoff (personal communication) has developed a connectionist program that derives image-schemas from perceptual input. Thus, it is plausible that this kind of redescription could accompany the type of perceptual learning that is taking place during infancy. Further, as I will try to show, the kinds of concepts that we have reason to believe are being formed in infancy are remarkably well represented by image-schema notions.

Animacy

I will use the notion of animal to illustrate the function that image-schemas can serve for the preverbal infant. On what basis do infants distinguish animals from non-animals? Although we do not know exactly, I propose the following hypothesis. First, infants on a purely sensorimotor basis learn to distinguish objects that engage in biological motion from those that do not. Work by Bertenthal and his colleagues (e.g., Bertenthal, Proffitt, Kramer, & Spetner, 1987) shows that infants can distinguish the motion of people from related but nonbiologically correct motion as early as 3 months. I am taking a further step here by suggesting that perceptual categorization of biological motion in general may occur, much in the way that categorization of phonemes or faces occurs. These categories are perceptual, i.e., sensorimotor, in nature, however, and we are searching for a conceptualization of them. How might the category of animal be conceptualized? We know from Leslie's work that infants are also sensitive to the difference between caused and noncaused motion. I suggest that infants, through the process of perceptual analysis, notice that those objects which move in one way start up on their own and that objects which move in another way do not, but instead are caused to move. Here is a beginning redescription of the class of biologically moving objects. The
infant may not be able to conceptualize the motion itself very well, but can conceptualize that these are the kind of things that start up on their own.

There are other important aspects of motion that may enter into the initial conceptualization of animate objects, such as the fact that the self-starters engage in contingent motion vis a vis other objects from a distance, whereas the nonself-starters never respond contingently from a distance. I have described this aspect of the concept of animacy elsewhere (Mandler, 1990). Here I want to develop the notion of "start up on its own" or "caused to move" in a little more detail.

To say that an object starts up on its own is to concentrate on the beginning of its trajectory. Many of the image-schemas that cognitive linguists have described involve trajectories; indeed, the simplest image-schema seems simply to be that of PATH: an object moving through space without regard for the nature of the motion. However, a trajector must begin motion in some way, and there seem to be two crucial ones: either it starts independently of any other object, or another object (trajector) "runs into" it. I am proposing that one aspect of subjecting a trajectory to perceptual analysis is to describe its beginning in one of these two ways. In the case of the class of animate objects, the description is an image-schema representing SELF-MOTION. This schema, which I illustrate below in a crude sketch, is what self-motion means; there is no simpler or more direct representation of the idea. For example, if you are not allowed to use words, about the best thing you can do to communicate the meaning of self-motion is to put your hand (A, in this example) at rest and then move it. It is something like that I am attempting to illustrate in this sketch. (Needless to say, the sketch itself is only for communicative purposes and is not meant to delineate the actual image-schema representation. Although I assume that image-schemas are used in the formation of imagery, they are not themselves images).

![Self-Motion Schema](image)

SELF-MOTION

A

It seems likely that in addition to redescribing the way that animate objects begin their trajectories, infants also redescribe something about the character of the trajectory itself. Such redescription may be optional and in any case it must be fairly crude. Even as adults we are poor at describing how animate objects move. The parameters that are involved are apparently still not well understood even by workers in the field of robotics, although I understand they involve such factors as coupled oscillations of limbs and various changes in the center of gravity as motion proceeds (see Wilson, 1986). The point is that if these aspects of motion are not known to the average adult, they cannot be part of a concept of what animate motion looks like.

In spite of not being able to conceptualize animate motion accurately, adults can make detailed perceptual judgments as to whether something is moving in an animate fashion or not. Stewart (1984) has shown that we make such judgments in part on the basis of the contrast between motion that is in accord with or violates Newton's laws of motions. One type of violation of Newtonian motion involves irregular or unpredictable paths, and that may be all that infants conceptualize. Thus, if we assume that infants analyze something about the nature of a trajectory in addition to its onset, we would have an image-schema representing ANIMATE MOTION that can be summarized by the following sketch:
Caused motion and inanimacy

Infants appear to be inordinately attracted by all moving objects, and of course, many of these are inanimate. Inanimate objects are those that begin motion only through the interaction of other objects; specifically, they are caused to move. The following sketch illustrates an image-schema of a simple case of caused motion: that of launching. A trajectory ends (or shifts) its path at the place and point in time that trajector B begins its path.

This is exactly the type of causal motion that Leslie (1988) showed infants to be sensitive to. That is, they categorize this kind of motion as a different type from one in which there is a gap (either spatial or temporal) between the end of the first trajectory and the beginning of the second. Leslie suggests that this "causal perception" is the foundation on which a concept of causality develops. In addition, I am suggesting it is also one basis on which the concept of inanimacy develops. Of course, there are inaniamtes, such as cars, that appear to move on their own. Although one might expect this to lead to a mistaken opinion of the animacy of cars by young infants, it should be noted that cars move on nonbiological paths, (i.e., they do not follow the image-schema for animate motion) so any such mistake should not be long lasting. If such a mistake does occur, our data suggest it has been corrected by 9 months of age (Mandler & McDonough, in preparation).

The concept of agency

The type of launching I have been discussing is mechanical in nature, as in the case of one billiard ball hitting another. But of course animate objects can cause objects to move as well, and it seems likely that this is observed even more frequently by young infants. An image-schema representation of agency can be constructed fairly simply by combining the image-schemas of ANIMATE MOTION and CAUSED MOTION. The following is a rough illustration of an image-schema of AGENCY:

We do not know when such a conceptualization might arise in infancy. It has usually been suggested that a concept of agency is a fairly late development. However, this image-schema does not seem markedly more complex than the others I have described, so we can speculate that the notion might be created from perceptual analysis relatively early. Leslie (1982, 1984) has provided some data that support such an assumption. He studied infants' reaction to hands that picked up objects. In one experiment, 4- and 7-month-olds watched a film of a hand picking up an object. When they then saw another film of the hand picking up the object without making contact with it, they appeared to be surprised. Of course, even by 4 months of age, infants must have begun to form perceptual schemas of hands
interacting with objects and so we perhaps should not be surprised at this reaction to a violation of expectations. Yet, in another experiment Leslie (1984) found that 7-month-olds did not show the same reaction when a block of wood was involved. They watched a film of a block of wood picking up an object. When the film changed to a block of wood picking up the object without making contact they did not show any particular surprise. Such an event should also create a violation of expectations, if the infants had not already been habituated to an equally anomalous event: blocks do not pick up objects with or without contact. Taken together, these findings suggest that by 7 months, infants have learned something about the notion of agency.

The concepts of containment and support

Before returning to the issue of language acquisition, I will briefly discuss two other early concepts that can be represented in image-schema form. These are the concepts of containment and support relations, or "in" and "on". Lakoff (1987) and Johnson (1987) have presented analyses of the image-schemas involved in the notion of containment, and Brugman (1988) in her work on the linguistic uses of the term "over" includes image-schemas that describe support relations. All I want to add here is that these notions also appear early in infancy. Freeman, Lloyd, & Sinha (1980) showed that 9-month-olds are less apt to become confused in an object-hiding task when a container is used as the hiding place; they suggest that infants have learned that containers are places where things disappear and reappear. Similarly, Kolstad and Baillargeon (1990) showed that 10-month-olds understand that containers must have bottoms to hold things. The latter is actually rather sophisticated; one might speculate that an earlier notion of containment would more likely be that described by Lakoff (1987) as the CONTAINER image-schema: merely an interior, exterior, and a boundary between. Thus, a simple CONTAINMENT schema might be represented as an object, X, in an at least partially enclosed space:

CONTAINMENT (X)

However, the most recent research on this issue (Kolstad, 1991) shows that even 5.5-month-olds are surprised when containers without bottoms hold things. This finding suggests that the earliest notion of containment may include a notion of support as well as the aspect of being (largely) surrounded. Containers, of course, often have the property of opening and closing, which means the degree of surroundingness varies from time to time. Piaget (1951) documented the way in which his children from 9 to 11 months used the notion of opening and closing in an analogical fashion to understand what was happening when he blinked his eyes. In response to his modeling this action they sometimes opened and closed their hands and mouths before they learned to perform the correct imitation. It appears that they were using an already formed image-schema as an analogical aid in learning to imitate a bodily action they could not see themselves perform.

About the only information we have on the development of a concept of support is a study by Baillargeon and Hanko-Summers (1990) showing that 8-month-old infants are surprised when support relations between blocks are violated. A primitive SUPPORT image-schema might require only a representation of contact
between two objects in the vertical dimension. I offer here a sketch of a primitive image-schema of SUPPORT, in the form of an object, X, above and in contact with a surface:

\[
\text{SUPPORT} \quad \underline{X}
\]

According to Baillargeon, 8-month-olds only represent the presence or absence of contact and not until later do they represent how much overlap in surfaces is required to maintain support. That is, considerations of gravity or weight distribution do not yet appear to be involved. Thus, the earliest notions of both containment and support may be quite simple, and in my opinion could be derived from equally simple redescriptions of the events that infants experience on a daily basis.

**Image-schemas and language acquisition**

Image-schemas, based on a redescription of the spatial structure infants experience every day, would seem to be particularly useful in the acquisition of various grammatical notions in language. Cognitive linguists have proposed image-schemas as the basis of understanding modals (e.g., Sweetser, 1990; Talmy, 1988), prepositions (e.g., Brugman, 1988), verb particles (Lindner, 1981), tense and aspect (Langacker, 1987) and presuppositions (Fauconnier, 1985). These are some of the aspects of language acquisition that have seemed most difficult to explain in accounts that assume a relatively impoverished conceptual base in infancy. Yet Brown (1973) and others showed that a number of relational morphemes, such as the prepositions "in" and "on", possession, and the progressive aspect of verbs, are early acquisitions. Others, such as linguistic transitivity, follow shortly thereafter. Each of these seems relatively easy to account for if we assume that image-schemas representing these notions are well established at the time that language begins. For example, image-schemas of CONTAINMENT and SUPPORT should make the use of the prepositions "in" and "on" just as obvious to a child as that a particular object is called by a given name. Indeed, "in" and "on" are not only the earliest prepositions to appear in child speech, but apparently are learned in errorless fashion (Clark, 1977; Johnston, 1988).

The acquisition of quite abstract notions, such as linguistic transitivity, also seems less difficult to understand when their image-schematic basis is emphasized. Slobin (1985) has pointed out that linguistic transitivity tends to be underextended in early child language. In its first appearances in speech, transitive marking occurs only when the child is talking about someone manipulating inanimate objects. Slobin calls this situation the prototypical manipulative scene. According to the account given here, an animate object causing an inanimate object to move is the easiest to represent because it conforms most closely to the image-schema of AGENCY; no metaphorical extension to less movement-like paths is required.

Similarly, Slobin notes that at first only inanimate patients are given accusative markings, and that when a language uses different accusative forms for animate and inanimate objects, this is a difficult distinction for children to learn. Such difficulties are potentially as informative as the ease with which the prepositions "in" and "on" are learned. The simplest image-schema for an inanimate object is that it is something acted upon and that does not act itself. It must take further analysis to think of animates as objects that can be acted upon as well.
Many other early grammatical morphemes, such as possession and the progressive aspect, can be simply described in terms of image-schemas that represent END-OF-PATH and TRAVERSAL-OF-PATH. Just as focus on the beginning of a path emphasizes the animate or inanimate character of an object, focus on the end of the path emphasizes its destination. In a primitive sense, the location where an object comes to rest is where it "belongs." The destination of an object is often expressed by the dative, and it is of interest that confusions between the going-to and the belongs-to sense of "to" have been reported in young German speakers (Mills, 1985). I have observed an English speaking child whose first use of the term "my" appeared to refer to himself as destination for an object, rather than to the more complex social aspects of possession found in adult meanings (Slobin, 1985). Such observations suggest that destination, in the sense of where objects end up, may form the earliest meaning of possession. In similar fashion, focus on an object's path, rather than its beginning or end, emphasizes the ongoing trajectory itself, and could well form the basis for the early understanding and acquisition of the progressive aspect of verbs in English.

I have discussed only the simplest of image-schemas here. Yet these very simple notions can be used not only to represent early conceptual constructions, but they also form the foundations for more sophisticated variants that occur slightly later in development. They also appear to be useful in understanding early grammatical acquisitions. So in a search for a representational format for preverbal concepts, we find a representational format that also can serve as a bridge to language. This is a serendipitous result of a quest that was originally motivated by the need to account for the appearance in infancy of concepts such as animal and vehicle. If we can find a single mechanism that relates the course of learning in two different fields, we may be able to develop a comprehensive theory that encompasses both.

References


Temporal Priority and Pragmatic Ambiguity: The Case of *Already*
Laura A. Michaelis
University of California, Berkeley

0. Introduction

Among those adverbs which serve to locate states of affairs with respect to time points, one can make a division between those, like *now*, which serve a tenselike function, and those which can instead be identified with certain aspecual categories. In the former case, verb and adverb co-refer to a given reference time; in the latter case, reference time is supplied by the tense of the predication alone—the adverb, like an aspecual operator, accepts any tense specification. An adverb of the latter type is temporal *still*, which Traugott and Waterhouse (1969) regard as an adverbial manifestation of imperfective aspect, the aspecual class of predicates (stative and progressive) with which it co-occurs. Another adverb grouped in the aspecual class is *already*. Analyses of *already* (and its analogs in other languages) have typically focused upon the manner in which this adverb’s semantic structure is related to that of an associated verbal construct, the perfect. No one of these studies, to my knowledge, has examined the relationship between *already*’s semantic structure and the types of communicative functions served by *already*. It is the purpose of the present paper to investigate the manner in which features of the linguistic and extralinguistic context interact with the lexical specifications of *already*, inducing a number of use distinctions. An account of these usages relies upon an understanding of the basic semantic structure accessed in each of the contexts at issue. Toward that end, we might first attempt to sort out and revise some previous accounts of the semantics associated with *already*.

Many of these accounts have employed certain conventions of tense logic to specify necessary and sufficient conditions governing the validity of sentences containing this operator. The only clear agreement among all of the analyses consists in their portrayal of *already* as a sentential adverb which encodes or at least reflects the existence of a given state of affairs at reference time. This state of affairs is coded by the clausal material within the adverb’s scope. Let us call the coded proposition the *Already State* (AS). Thus, the AS of (1) is *All of the paratroopers have left the Baltic region*:

(1)  All of the paratroopers have ALREADY left the Baltic region. *-The Daily Texan 1/31/91*

There is some disagreement as to what further conditions the adverb places upon the AS. In one group of analyses, of which Horn (1970) and König (1977) are representative, that further condition—a presupposition in Horn’s formulation—is only that the AS obtain for some time span following reference time. This condition seems to arise from a general constraint upon stative predications: states are characterized by temporal extension; they cannot obtain at a single moment alone. The peculiarity of the gnomic sentences given in (2) demonstrates that this condition is not sufficient to describe those constraints imposed by *already* per se:
(2) a. ?Oil ALREADY floats on water.
   b. ?The earth ALREADY revolves around the sun.

In another group of analyses—of which Doherty (1973), Hirtle (1977), Abraham (1980), Hoepelman and Rohrer (1981), and Mordechay (1986) are representative—already is a completive marker, insofar as it serves to code the existence of a situation which has arisen from an anterior event. Hence, the AS of (1) represents the aftermath of the paratroopers' earlier departure; it might be paraphrased as There are no paratroopers remaining in the Baltic region. Several of these analysts have remarked upon the close association of already with the resultative perfect. The latter construct serves to present a current situation as the result of some previous event (cf. Fenn 1987). It is already's manifest sympathy for such semantic content which apparently led Traugott and Waterhouse (1969) to decree that “already should be specified as the realization of a...set of features associated with [the] perfect”. A number of those who view already as a marker of resultant states—e.g., Doherty and Abraham (op. cit.)—have further suggested that this operator presupposes the nonexistence of the AS during a phase prior to reference time. Doherty's definition is given in (3), with S=AS:

(3) already  presupposition: phase 1  (not-S)
       assertion: phase 2  (S)

(Doherty 1973)

It is apparent, however, that while already can function as a marker of resultant states in the manner suggested, the presupposition given in (3) is not encoded in its semantic structure. The examples given in (4) demonstrate that already need not scope a proposition representing a resultant state. The operator is equally comfortable with an AS representing a historically stable situation, i.e., one that has obtained for some period of indefinite length prior to reference time:

(4) a. “The strawberry one [i.e., frappé] has fewer calories. They don't have to put sugar into it because the strawberries are ALREADY sweet.”
   b. If sour cream is ALREADY sour when you buy it, why does it have an expiration date on the package?—“Farley”, SF Chronicle 11/17/90
   c. “Why would you need a permanent? You ALREADY have curly hair.”

In such examples, to be discussed below under the rubric of “priority to process”, already appears simply to indicate the presence of a state in advance of any procedure or event sequence known to subsume that same state as an endpoint. Thus, for example, the sweetness of the strawberries (the AS) is held in (4a) to render a sweetening procedure superfluous, just as the existence of the AS of (4c), possession of curly hair, is understood to obviate the procedure designed to bring about that state. The AS's here represent intrinsic properties which are not construed as resultant states. Such examples also provide counterevidence against those proposals (notably Hoepelman and Rohrer op. cit) in which already is
represented as encoding the assertion that the eventuation of the AS is premature with respect to a given schedule of events. Such analysts point to examples of the kind given in (5):

(5) When we arrived, before noon, Huey was ALREADY drunk. -Ken Kelley, “Huey Newton”, California Magazine 8/90

In (5), already serves to assert that the state of inebriation has come about at a point prior to the time at which it might be expected to eventuate. The examples given in (4) show that the flavor of expectation contravention associated with already in (5) is not a reliable concomitant of its semantic contribution. Since in (4) the AS is not a resultant state, it cannot therefore represent a situation arising at an earlier than expected point. The expression of early eventuation is, I will argue, a salient usage of already, but not one deserving of codification into the semantic structure of the operator. Rather, I will argue, the usage exemplified in (5) is only one of a set of such usages arising out of already's basic function as a marker of temporal priority. We might now then turn to this function and the use distinctions arising from it.

1. Semantic Structure

A central claim of the present analysis is that already not only encodes the existence of a given state of affairs at reference time, but also presupposes the anteriority of that state of affairs to an interval of a specific type. Let us call this interval the Reference Interval (RI). The RI is defined as including a state which is effectively identical to the AS. The semantic structure at issue might be schematized by means of the diagram given in (6):

(6) \[ \text{AS} < \text{RI AS}' \]

In (6), the assertive component\(^3\) (existence of the AS at reference time) is given in boldface. The “less than” indicates that the AS obtains at some time prior to the RI. The RI and the anteriority relationship itself is presupposed, as indicated by plain typeface. Evidence for this presupposition is provided by such sentences as (4b), in which the entailment of anteriority (to a process) exists within a polarity context (conditional protasis). The RI, which, as we will see, is frequently construed as hypothetical, is represented as including a state, AS'.\(^4\) AS' is intended to represent that state which is analogous to (i.e., of the same situation type as) the AS necessarily anchored by some reference time. We will see below that there are uses of already in which the RI and AS' coalesce. The contrast pair given in (7) provides an illustration of the manner in which already sentences conform to this schema:

(7) a. The ALREADY unstable overpass was rendered dangerously weak by the quake.
b.? The ALREADY stable overpass was rendered dangerously weak by the quake.

Sentence (7a), in which, I will argue, already codes priority to further accretion of a scalar property, fits the conditions of (6) in the following fashion: the AS—the instability of the overpass—exists prior to an RI—the period of the earthquake—during which additional weakening (the AS') obtains. The anomaly of (7b) stems from the fact that it fails to meet the conditions of (6): the AS (overpass stability) is not subsumed by the subsequent RI, an event during which a state of instability is created. The RI thus here subsumes a state of affairs (AS') which differs from the AS. Hence, the requisite identity between the AS and AS' is not present. We might note that another marker of temporal priority, previously, is not restricted by the identity condition of (6). Because this adverb would code only anteriority of the past state of stability to the phase of instability, it can be substituted for already in (7b), rendering that sentence acceptable.

The definition given in (6) is certainly reconcilable with the program of the aforementioned analyses. It might easily be cast in terms of a tense logic—such as that used by König and Traugott (1982)—which makes reference to superordinate events (RI properly includes AS'), as well as like situation types (AS=AS'). Nonetheless, it would seem that whatever its formal realization, this definition alone does not provide an account of the interpretive mechanism brought to bear upon tokens of already in context. Already can be regarded as an instance in which “linguistic content significantly underdetermines first level, ‘literal’ interpretation” (Kay 1989). Within the constraints imposed by the semantic schema (6), there are, it seems, several construals that can be placed upon the underspecified RI. Each of these construals has been touched upon: that manifested in the expression of priority with respect to a process in (4), with respect to an expected eventuation point in (5), and with respect to further accretion along a scale in (7).

I will claim that the apparent fluidity of interpretation allowed by the underspecified RI renders already pragmatically ambiguous in the sense of Horn 1985. That is, the semantic structure of (6) can be harnessed for a variety of uses. These uses (i.e., anteriority-marking functions) are derived from the interpretive instructions provided by the context. The remainder of this paper will be devoted to a closer look at the various functions served by already and the manner in which these functions arise from the contextual specifications imposed upon the RI of schema (6). The uses at issue are: (a) priority to process, (b) priority to expected eventuation point, and (c) priority to further accretion.

2. Functions

2.1. Priority to Process. This usage, exemplified in (4), can be schematized by means of the diagram given in (8):

\[
\begin{array}{c}
\text{AS} \\
\square \square \square \text{AS'} \\
\text{RI}
\end{array}
\]
The RI in (8) represents a schematic process (Mordechay 1986)—a sequence of distinct situation states arrayed along a time line. This process frequently represents a procedure designed to bring about a given end state (as the permanent procedure of (4c) culminates in curly hair). The end state of this process (the AS') is analogous to the AS, which may itself be the resultant state of a process. The inceptions of the RI and of the AS are not temporally ordered with respect to one another; all that is required, as indicated by (8), is that the final state of the RI obtain at some time later than that situation depicted by the AS. If the RI is presumed to be hypothetical, like that defined by the permanent contemplated by the addressee of (4c), then the anteriority of the AS (the present curly hair) to the AS' (the effected curly hair) necessarily obtains.

The sentences in (9) provide further examples of the priority-to-process usage schematized in (8). Each sentence is accompanied by a listing of the elements filling the roles provided by the schema (6):

(9) a. Police responded to a bomb threat at a Denny's restaurant early yesterday to discover that an employee had ALREADY moved the suspicious device to the parking lot. -SF Chronicle 6/1/90
   a.' AS=bomb removal; RI=police intervention; AS'=bomb removal
   b. Tired of all the bustle? Take a break and head for Long Island Sound, where you won't even need fishing poles in some areas because the fish are ALREADY dead.-Newsweek 7/16/90
   b.' AS=fish death; RI=fishing; AS'=fish death
   c. Don't stop him if he's telling a joke you've ALREADY heard, and
      laugh anyway. -How to be a Great Date, Cosmopolitan 11/90
   c.' AS=joke known to addressee; RI=telling of joke to addressee;
      AS'=joke known to addressee

I wish to include under this heading a usage of already that appears to be a counterexample to the condition, imposed by (6), that the AS and AS' represent effectively identical situations. In this usage, exemplified in (10), the AS is an undesirable situation, and the RI is a preventative measure—a process designed to obviate, rather than effect, that situation. In such cases, the final state of the RI, the AS', represents the lack of that situation coded by the AS. Hence in this usage there does not appear to be the requisite identity between the AS and AS' situations.

(10) a. It was too late to stop that war in hearing rooms 25 years ago because our boys were ALREADY dying, and that of course meant more boys must die. -Rob Morse, SF Chronicle 12/2/90
   a.' AS=warfare; RI=effort to prevent war; AS'=lack of warfare
   b. Since you've ALREADY bad-mouthed me on the air, I'll take the blame for it. But I think most of your listeners with any intelligence know that it wasn't me. -Mark Ibanez, KGO-AM 11/12/90
   b.' AS=publicly slandered character; RI=prevention of said slander;
      AS'=unbesmirched character

The manner in which the usage exemplified in (10) does in fact conform to (6) can be seen in examples (11a-b). Here the first continuation represents a
straightforward instance of the priority-to-process usage of (9) and the second an
instance of the usage shown in (10), wherein the RI represents a preventative
measure:

(11) First Deposit won't receive a federal bail out because
    a. it's ALREADY solvent (cf. (9))
    b. it's ALREADY gone bankrupt (cf. (10))

This example demonstrates that the RI—receipt of the loan—can be viewed
both as a procedure designed to effect solvency (11a) and as a means of preventing
bankruptcy (11b). In the latter case, the process filling the RI role can be viewed as
an event sequence whose outcome ranges over two potential situations: the desired
resolution (solvency) that the process is intended to effect or preserve, and the
undesired resolution (bankruptcy) that the process is intended to obviate. Insofar as
both types of resolutions instantiate the procedure's possible outcome, they are
analogous. Hence, in such examples as (11b), there is in fact the required identity
between the AS' (=solvency or bankruptcy) and the AS (=bankruptcy) in which the
RI has culminated.

It can further be noted that the usages exemplified in (11a-b) share an
argumentative point: both are used to assert that the existence of the already-scoped
state of affairs obviates the need for some course of action, whether that course of
action has thereby been rendered unnecessary (as in (11a)) or futile (as in (11b)).

2.2. Priority to Expected Eventuation Point. In this usage, exemplified in (5),
already codes the premature appearance of an eventuality which has been anticipated
by the interlocutors. As shown in (12), this usage can be schematized in a manner
similar to that suggested by Hoepelman and Rohrer (1981), who use two parallel
time lines to represent, respectively, the actual time at which a given situation
obtains (the AS) and the time at which that situation was expected to obtain (the
AS'). Here, the two rows of boxes are intended to represent two schedules or
situation sequences (actual and expected) arrayed along a timeline. The AS is
shown to obtain at some less advanced point on this timeline than does the
analogous state of affairs (the AS') within the hypothetical situation-sequence:

(12) AS
     t----tn----
     AS'

The expected eventuation point (the AS') appears to come in two basic varieties:
(a) that whose placement along the timeline is determined simply by stipulation (a
given event is regarded by speaker or hearer as scheduled for a particular interval)
and (b) that whose placement is determined by cognitive modeling of event
sequences—a script or an idealized path of development. Sentence (13) provides an
example of the former type; here, already codes the anteriority of Uncle Harry's
presence (the AS) to that point (5 o'clock=AS') at which his presence had been
scheduled by the speaker:
(13) Uncle Harry is here ALREADY? We didn't expect him until five.

In that usage involving a conventionalized point of eventuation, the timeline
within the speaker's expectations contains a conventionally given event-sequence.
This sequence subsumes a component state (the AS') analogous to the AS. In
examples (14a-b), this event sequence represents a canonical course of
development, within which component states or situations are associated with
particular time points. Already codes the presence of a situation at some less
advanced point along that timeline than would be predicted by the model:

(14) a. Dave, a wiry 7-year-old Concord boy, has ALREADY battled a few
of life's adversities. -SF Chronicle 12/23/90
b. When it took six days for a postcard to go from Chicago to LA,
guess who ALREADY made a fax machine? -Toshiba commercial
4/28/90

Thus, for example, (14a) both presupposes and contravenes a model in which
one's experience with adversity exists at some point later in life than age seven.
Conventionalized sequences may not only associate situation states with particular
time points, but may also simply order situation states with respect to one another.
The examples in (15) demonstrate that already can also code the inversion of
component states within a script—i.e., the presence of a given state of affairs (the
AS) at a point before that slot (the AS') provided for it by the script:

(15) a. The Iraqis were ALREADY heading for the demonstration point,
before they'd heard what I'd said. -G. Bush, press conference
following his address on Iraqi TV 9/17/90
b. You know what happens in a fancy restaurant? When you sit down,
there's ALREADY a plate in front of you. But they take that plate
away as soon as you sit down. -Charlie Brown, "Peanuts" 5/6/90

Thus, adduction of the usage given in (15) requires one to presume scripts in
which a protest measure follows the delivery of the offensive political statement
(15a) and the presence of the plate before the diner obtains only after he has ordered
(15b). The actual time-scale reverses the elements of these scripts, and already thus
marks the anteriority of the AS with respect to the canonical point of eventuation
assigned to that situation by the script (the AS').

2.3. Priority to Further Accretion. As shown in (7a), already can be used to
indicate that some fairly advanced degree of a given scalar property is present at
reference time, in advance of any further accretion of that property along the same
scale. This usage can be schematized as in (16), wherein the AS is the value for the
scalar property present at reference time and the RI subsumes any greater degree of
the property at issue (AS'), whether hypothetical or actually obtained. The degrees
of the scale are paralleled by moments along a timeline:
(16) \[ \text{AS}\{\text{RI-AS'}\} \Rightarrow t \text{tn} \]

The identity between the AS and AS' required by the semantic schema of (6) is present by virtue of the fact that the two situation states are instances or degrees of the same (scalar) property. Further examples of this usage are given in (17):

(17) a. ...the Cal bookstore is posting reasons for axing Stanford in the Nov. 17 Big Game, [my] favorite being There are too many Muffys and Biffs in the world ALREADY. -Herb Caen, SF Chronicle 11/10/90

b. Considering that Cooper has ALREADY been in telepathic contact with extraterrestrials, a supernatural Bob wouldn't be too far-fetched. -John Carman on "Twin Peaks", SF Chronicle 11/13/90

c. Experts estimate that the full gear will add 10 degrees to the ALREADY searing daytime desert temperatures. -Newsweek 8/20/90

Thus in (17b), for example, the present plot situation is held to have obtained a rather high degree of storyline weirdness (the AS) prior to the introduction of a supernatural antagonist, a development which would result in further advancement along the scale in question (the AS').

Like the priority-to-process usage, this form of anteriority coding can be identified with a particular argumentative force (cf. section 4). Sentences of the type given in (17) are typically used to lead the addressee down a reasoning path of the following sort: since the AS in itself represents a fair degree of advancement along some scale (AS=searing heat in (17c)), any further advancement along that scale (RI=heightened temperature associated with the wearing of the combat gear) will produce a very high degree of the property at issue (unbearable heat).5

3. Function Construal

3.1. Coalescence. Now that we have looked at the three functions of already, one disclaimer seems to be in order: these uses have been treated as discrete only for purposes of exposition; they frequently coalesce. That is, it is often the case that interpreters need not resolve a given instance of use ambiguity in favor of one or another function. Such use coalescence is a hallmark of use ambiguity. Thus, for example, Li, Thompson and Thompson (1982) demonstrate that function conflation characterizes the pragmatically ambiguous Mandarin perfect marker. Similarly, it appears that in certain contexts, more than one of the communicative functions served by already may be accessed by the interpreter. The sentences in (18) are intended to exemplify this situation:

(18) a. [Patty:] If we win today, Marcie, I'm going to let you keep the game ball! [Marcie:] It's ALREADY my ball, sir. My dad gave it to me for my birthday. -"Peanuts" 11/9/90
b. Why did you go for the scotch if Sunny was ALREADY soused?  
-A. Dershowitz, “Reversal of Fortune”

Thus in (18a) already serves to signal both priority to process and priority to expected eventuation point: Marcy asserts not only that the ball is hers prior to the process of winning it, but also indicates her presumption that her possession of the ball at this point in the proceedings will appear premature to her addressee. In (18b), already appears to indicate both priority with respect to a process and priority to further accretion: Sunny’s drunken state obtained prior to any effort to effect that state, and prior to that advancement along the scale of inebriation represented by the consumption of the scotch. Thus, the Reference Interval may be subject to several simultaneously available construals in a given context.

3.2 Contextual selection. More typically, perhaps, the context will select as preferred a given form of priority coding. This can be seen in (19), where the three continuations (a-c) represent distinct sets of contextual instructions, by means of which the interpreter can adduce each of the three respective usages:

(19) Harry’s ALREADY rich;
   a. he doesn’t need your stock tip (priority to process)
   b. and he only started investing last fall (priority to expected eventuation point)
   c. if this new deal goes through, he’ll be a millionaire (priority to further accretion)

4. Argumentative Force

It is useful to distinguish between (a) uses of the semantic template (6) and (b) uses of assertions invoking a given function. The former are akin to the three functions of already discussed in section 2; they devolve upon distinct interpretations of the RI. The latter can be discussed under the rubric of argumentative force. As mentioned earlier (sections 2.1 and 2.3), certain functions of already can be used in the service of a particular argumentative goal. A given variety of already-style temporal precedence has an argumentative force insofar as assertions invoking it exploit the capacity of the addressee to derive from the already-bearing proposition a certain type of conclusion. Thus, for example, the prior-to-process assertion (4c) requires the addressee to infer from the fact that the AS (curly hair) exists at present—prior to any effort to effect the AS—the conclusion that a procedure intended to bring about the AS (the permanent) is not necessary. It is the speaker’s argumentative intent that the addressee should draw this conclusion. That it can be used to further this argumentative intent is characteristic of the form of priority coding exemplified in (4).

It should be noted that not every use of already has a distinct argumentative value (i.e., distinct from its contextually specified function). Thus, where already codes priority with respect to an expected eventuation point (2.2), it simply functions as a comment upon the prematurity of the AS; such usages do not require of the addressee any inference thereof.
5. Conclusion

I hope to have demonstrated that a complete account of already’s function should refer not only to the variety of temporal priority schematized in (6) but also to the manner in which a lexically underspecified Reference Interval included within this schema receives an interpretation in context. This investigation of the various contextually governed subfunctions of already then demonstrates the manner in which the semantics of a grammatical morpheme having no particular discourse-pragmatic function—in this case a marker of temporal priority—is refined or augmented to fit certain communicative needs. Typically, this communicative need can be identified with an argumentative goal—that of inducing the addressee to derive a particular conclusion from an assertion invoking a given variety of already-style temporal priority. Hence, contextually provided specifications (those “fleshing out” the RI) provide a means of mediating between a semantic template and the various argumentative ends for which that template might be used.

Endnotes

1  For their help in developing the present analysis I would like to thank Gene Buckley, Charles Fillmore, Jean-Pierre Koenig, and Knud Lambrecht.

2  Two disclaimers are in order here—the first involving the notion of sentential vs. propositional scope, the second involving the distinction between temporal and aspectual operators:

   (i)  It appears the scope of already may best be defined not in syntactic but semantic terms. There are a number of instances in which already appears to have predicational rather than sentential scope. Already often seems to scope only a modifier—as in (17c), already searing. In such instances, however, already does have propositional scope—over the predicate-argument structure dubbed the AS (already [AS the temperatures are searing]). While the AS is often realized as a sentence, it need not be.

   (ii) As mentioned in the introduction, already, like still (and unlike such indexical temporal adverbs as yesterday and now), can combine with a predication of any tense. Already and still do represent temporal adverbs insofar as both adverb types (a) have propositional scope and (b) can be regarded as a two-place function ('obtains at') relating that proposition to a time interval. The distinctive ability of already-style adverbs to combine with various tenses can be attributed to the fact that their chief function is not to place an eventuality with respect to speech time; it is to place that eventuality with respect to a nondeictic interval (i.e., one not necessarily equated with speech time). With regard to still, this interval is a presupposed period of prior instantiation of the state of affairs in question (König and Traugott 1982); with regard to already, this interval is a subsequent phase (RI). Still is then analogous to imperfective aspect insofar as it codes continuity or stasis over time; already is akin to the (present) perfect, which relates an event to a discourse-active phase of aftermath (Dinsmore 1991). These suggestions are in keeping with the original claim of Traugott and Waterhouse (1969) that adverbs in this class are manifestations of certain verbal aspectual categories. Their claim,
however, is seemingly based only upon the aspectual class of predicates with which these adverbs typically co-occur; the present claim is based upon isomorphic semantic structure held to unite the adverbial and aspectual constructs and to account for the observed co-occurrence of the two types of constructs. Such co-occurrence is good evidence that the adverbs in question are sympathetic to the semantics of the associated verb aspect. Nonetheless, already cannot simply 'copy' the semantic features of the perfect; it need not co-occur with the perfect. The semantic structures of the aspectual adverb and its attendant verbal aspect are thus not wholly isomorphic.

3 To claim that already in such sentences as (1) asserts (rather than reflects) existence of the AS at reference time is a little inaccurate, as the corresponding sentence without already asserts the very same thing. We might then regard already's assertive component as redundant with that of the tense of the predication; the presupposed anteriority relation is the unique contribution of already. It should also be noted that the semantic assertion represented in the template (6) is not equivalent to the assertion within discourse that the AS obtains. As noted in fn. 5, where an already-sentence appears within a subordinate clause, the existence of the AS is pragmatically presupposed (presumed to be known to the addressee). Such pragmatic presupposition is to be distinguished from semantic presupposition: the former is specified within the lexical entry (as is the existence of the RI in (6)); the latter is akin to shared knowledge within discourse. Only where an already-sentence functions to inform the speaker of the existence of the AS—as in (5), e.g.—do the two forms of assertion coalesce.

4 Limitations of space prevent discussion of a distinct sense of already which, although also coding temporal priority, does not code priority with respect to an RI of the sort schematized in (6). Examples of this sense are given in (a-b):

(a) Those Muppets will live on in shows ALREADY taped by Henson. -“Entertainment Tonight” 5/21/90
(b) The Lao pilots brought the empty canisters back to sell the aluminum, having ALREADY snipped off the umbilical cords to sell the wire. -Stan Sesser, “The Forgotten Country” The New Yorker 8/20/90

In such examples, the RI simply represents a reference time subsequent to the inception of the AS; it does not contain any state analogous to the AS (AS'). Already here is paraphrasable by previously.

5 The argumentative force of a particular usage of already in a given context does not appear to arise from the fact that the already-bearing sentence functions to inform the addressee of the existence of the AS (although such was assumed in the oral version of this paper). In (17c), for example, the fact that the AS obtains is pragmatically presupposed: the AS is embedded in a participial relative clause; the addressee is presumed to know that the daytime desert temperature is high.
Nonetheless, already here has an argumentative force of the kind discussed in section 2.3.

References


Adverbial Quantification and Event Structures

Barbara H. Partee
University of Massachusetts/Amherst

0. Introduction.

The central concerns of this paper are the expression of quantification and the semantic distinctions between eventive and non-eventive sentences. The issues will be addressed in the spirit of what Emmon Bach 1986a calls "natural language metaphysics", as an inquiry into what ontological presuppositions best support an explicit semantics for natural language which characterizes truth conditions and entailment relations.

Determining what a given language quantifies over, and how, is one important source of evidence about the basic domains that are recognized in the semantics of that language. Here I will particularly be exploring the domain of individuals or entities and the domain of eventualities in the sense of Bach 1986b, including events, states, and processes; and extending the latter domain into the harder-to-pin-down realm of "situations" and "cases".

1. Quantificational structures.

1.1 Barwise and Cooper's NP Universal. One appeal of Montague grammar is the uniform semantic analysis of NPs as generalized quantifiers. Barwise and Cooper 1981 follow Montague in this respect and propose the following NP-Quantifier Universal:

(1) Barwise and Cooper's NP-Quantifier Universal: "every natural language has syntactic constituents (called "noun-phrases") whose semantic function is to express generalized quantifiers over the domain of discourse." (Barwise and Cooper 1981: 177)

The generalized quantifier perspective has led to illuminating studies of the semantic properties of NP's and DET's, but the universal in (1) needs to be sharpened and questioned. In the strong form in (2) below, it has now been falsified by Jelinek's work on Salish (see Jelinek 1988; to appear) and discussion in Partee (to appear; in preparation)).

(2) Strong form: All languages have essentially quantificational NPs, i.e. NPs which can be analyzed as generalized quantifiers but not reasonably as referential (type e) or predicative (<e,t>).
1.2.2 A-Quantifiers vs. D-quantifiers: Lewis, Heim, Kamp. Among the quantificational devices of English are determiners like *every*, adverbs like *always* and modals like *must*. Lewis 1975 uses (3a), interpreted as in (3b), to show that adverbs of quantification do not just quantify over times or events:

(3)  
(a) A quadratic equation usually has two different solutions.
(b) Usually, $x$ is a quadratic equation, $x$ has two different solutions.

(3b) has a tripartite structure consisting of a quantifier, a restrictive clause, and a matrix clause; it is true iff most things that satisfy the restrictive clause also satisfy the matrix clause. Quite generally, adverbs of quantification can unselectively bind any number of free variables in their scope, as in (4), true iff most pairs of things that satisfy the restrictive clause also satisfy the matrix clause.

(4)  
(a) Usually, if a man owns a donkey, he feeds it.
(b) Usually, $x_1$ is a man and $x_2$ is a donkey and $x_1$ owns $x_2$, $x_1$ feeds $x_2$

Adverbs of quantification may unselectively bind event variables as well as individual variables, as illustrated in (5) (Partee 1984a); we will have more to say about such cases below.

(5)  
(a) Usually, if a man sees a donkey, he feeds it.
(b) Usually, $x_1$ is a man and $x_2$ is a donkey and $e_1$: $x_1$ sees $x_2$, $e_2 > e_1$ and $e_2$: $x_1$ feeds $x_2$

Heim 1982 further tightens the parallels between determiner quantifiers and adverbs of quantification and brings modals into the picture. She argues that all three types of quantifiers may unselectively bind variables of various sorts, and that indefinite NP’s *never* carry any quantificational force on their own. (Analogous proposals are made independently by Kamp 1981.) Indefinite NP’s contribute a restrictive predicate and a variable to logical representations like (3b), (4b) and (5b): their quantificational force derives from the adverb. (For examples with no operator, Heim and Kamp propose an operation of existential closure, which will bind any variable introduced by an indefinite NP that has not already been bound.)

On the Kamp-Heim proposal to treat determiner quantifiers like *every* or *most* just like Lewis treats adverbs of quantification, a sentence like (6a) has a logical representation (6b) virtually identical with (3b), and with the same truth-conditions. And determiner quantifiers can also be unselective, as in the case of (7a), which on Kamp’s and Heim’s account has a logical representation analogous to (4b).
(6) (a) Most quadratic equations have two different solutions.
    (b) Most, x is a quadratic equation, x has two different solutions.

(7) (a) Most men who own a donkey beat it.
    (b) Most, $x_1$ is a man and $x_2$ is a donkey and $x_1$ owns $x_2$,
        $x_1$ beats $x_2$

In proposing to investigate further the syntax and semantics of different sorts of expressions of quantification cross-linguistically, Partee, Bach and Kratzer 1987 introduce the terminology D-quantification and A-quantification: 'D' is mnemonic for Determiner, 'A' for the cluster of Adverbs, Auxiliaries, Affixes, and Argument-structure Adjusters, all of which can be thought of as alternative ways of introducing quantification in a more 'constructional' way (Carlson 1983).

From the work of Jelinek we can conclude that D-quantification is not universal, but A-quantification so far seems to be (Bach, Jelinek, Kratzer and Partee, eds., in preparation). The investigation of the structure and interpretation of D-quantification and A-quantification provides an indirect means of exploring the semantics of the N-V distinction and its relation to a possible ontology of individuals and events (Davidson 1967, Langacker 1987, Partee, Bach and Kratzer 1987).

1.2.3 Tripartite structures as a unifying generalization. The sort of structure we have seen in (3b) - (7b) is represented graphically in (8).

$$
\begin{array}{c}
\text{S} \\
\downarrow \\
\text{Operator} \quad \text{Restrictor} \quad \text{Nuclear Scope}
\end{array}
$$

Such "tripartite structures" may be taken as a useful metatheoretical device for expressing the commonalities among several possible binary-branching structures, such as generalized quantifiers or structures in which an adverbial operator combines with the nuclear scope or matrix.

The following generalized tripartite structure shows a number of hypothesized syntactic, semantic, and pragmatic structures that can be argued (Partee, in preparation) to be correlated with each other and with the basic tripartite scheme.
2. Event structures and the proportion problem.

The proportion problem has been discussed by Partee 1984a, Bauerle & Egli 1985, Root 1986, Rooth (1987,1989) Kadmon 1987, Heim 1990, Berman 1987, Groenendijk and Stokhof (1990a,1990b), Chierchia (1988,1990), Schubert and Pelletier (1987,1989) and Kratzer 1989, among others. It is both an empirical and a theoretical problem, touching central issues in the syntax and semantics of quantification and indefinites, the construction and interpretation of tripartite structures, and the role of event variables in the analysis of natural language. The problem arises with non-universal proportional quantifiers like most, almost every, mostly, almost always. The empirical question is: what factors determine what is being quantified over? The theoretical challenge is to determine an appropriate mix of syntactic, semantic, and logical apparatus to be able to express and explain the empirical generalizations. As an example, consider (10) from Kadmon 1987.

(10) *Almost every* woman who *owns* a dog talks to it.

On the original Kamp-Heim analysis, (10) should quantify over woman-dog pairs, which is not equivalent to quantifying over dog-owning women, as the following scenario illustrates. Suppose one woman owns fifty dogs and talks to them all and nine other women own one dog each and don’t talk to it. If we count woman-dog pairs then (10) should come out true, but if we count dog-owning women, it should come out false. The empirical question is which is right, in this case and others, and what properties of the sentences (and their contexts) determine the choice.
A number of parameters that affect judgements and intuitions are undoubtedly affected by real-world knowledge as well. Here I focus on two relevant factors. One factor (Partee 1984a) is the syntactic difference between D-quantification and A-quantification. In examples (10-14) I indicate that parameter by annotating the examples with D or A. A second relevant factor (Kadmon 1987) is whether the restrictive clause contains an individual-level (relatively permanent, or atemporal) predicate or stage-level (episodic) predicate, using the distinction developed by Carlson (1977, 1980). Note that non-static predicates are all stage-level, while statives are split between stage-level (available, on fire) and individual-level (expensive, from Chicago). In examples (10-14) I use the annotations I for individual-level predicate and S for stage-level predicate.

(10) *Almost every* woman who *owns* a dog talks to it.  D, I
(11) *Almost always*, if a woman *sees* a dog, she talks to it.  A, S
(12) A woman who *sees* a dog *almost always* talks to it.  A, S
(13) *Mostly*, if a woman *owns* a dog, she talks to it.  A, I
(14) *Almost every* woman who *sees* a dog talks to it.  D, S

In (10) we have both D-quantification and an individual-level predicate; in such cases we seem strongly inclined to count women, not woman-dog pairs. Example (11) is maximally different: it has A-quantification and a stage-level predicate. In this case we seem much more inclined to count woman-dog pairs, or episodes of a woman seeing a dog, even if the same woman has occurred in a number of different episodes. A possible paraphrase of this reading is: "On almost all occasions on which a woman sees a dog, she talks to it."

Example (12) is suggestive of the complications that have to be considered. Like (11), it involves A-quantification and a stage-level predicate, but the restrictor clause comes from a noun phrase with one noun as the head noun (as in (10)) and the other inside a relative clause. I think there is still a tendency to count episodes as in (11), but a weaker one; we seem to have tension between a syntactically asymmetric structure and a preferred semantically symmetric (in the sense of Kadmon 1987) interpretation.

The comparison of (10)-(12) suggests that D-quantification and individual-level predication favor quantifying over individuals, while A-quantification and stage-level predication favor quantifying over episodes or cases.

When we consider the other combinations of the two parameters, as illustrated in examples (13) and (14), I think intuitions become less clear. In (13) we have A-quantification but an individual-level predicate, and judgements tend to be uncertain; similarly in (14), where the parameters are combined the other way: D-quantification but a stage-level predicate. My
impression is that the pull of the stage-level predicate toward quantifying over episodes is stronger than the push of the D-quantification toward quantifying over individuals.

Let us turn very briefly to some proposals for dealing with some of the proportion-problem data. On the most natural extension of the standard Kamp-Heim treatment, we would simply arrive at a representation similar to (7b). Such a reading is symmetric as regards women and dogs (appropriate for (11) and (12)), not the asymmetric reading quantifying over women that we want for (10). One of the first systematic treatments of the proportion problem, Kadmon 1987, argued that for cases like (10), there should be additional structure within the restrictive clause, as in (15).

\[(15) \text{ ALMOST EVERY } \begin{array}{c}
x \\
\text{woman}(x) \\
y \\
dog(y) \\
\text{owns}(x,y) \\
\end{array} \quad \begin{array}{c}
y \\
dog(y) \\
x \text{ owns } y \\
x \text{ talks to } y \\
\end{array} \]

The embedded box inside the antecedent box induces existential closure over the variable y contained within it: "for almost every x, if x is a woman and there is a y such that y is a dog and x owns y, ...". But then the occurrence of y in the consequent box; that pronoun is no longer accessible to its intended antecedent. Kadmon argues for the reinstatement of a version of Evans’ 1977 treatment of "E-type pronouns", with accommodation of a uniqueness presupposition in the consequent box. Kadmon’s work has touched off a debate on E-type analyses vs. Kamp-Heim-style analyses of anaphora that is still continuing.

There is another approach which Berman 1987 and Partee 1989 independently proposed, invoking an event or situation variable as a discourse referent in some cases. In my work this suggestion was for treating implicit antecedents for certain kinds of anaphora, as in (17), due to Roger Schwarzschild.

\[(16) \text{ Every man who owns a donkey beats it.} \]
\[(17) \text{ Every man who stole a car abandoned it within 50 miles.} \]
\[50 \text{ miles away.} \]

*Fifty miles away* involves adverbial anaphora that requires an anchor: fifty miles from where? The most natural interpretation is fifty miles from the location of the (quantified) stealing event. The example is like the donkey-sentence (16) but with the antecedent implicit. I argued for the inclusion of an event referent (a proposal that had been made in the context
of temporal anaphora by Kamp 1979, Hinrichs 1981, Bäuerle 1977, 1979, and Partee 1984a), and proposed that if a construction leads to the introduction of an event variable, then derivative elements like the time or the place of the event are available for anaphora. Note that the event-variable must be structurally licensed; predicates that merely entail the existence of an event do not license event anaphora, as can be seen by trying to substitute car thief or murderer in sentences like (17): the results are parallel to the anaphoric island cases studied by Postal 1969.

Berman’s proposal was made in the context of adverbial quantification and is more explicit about the individuation of the relevant situations. Kratzer 1989 builds on Berman’s proposal in developing an analysis of stage-level and individual-level predicates involving syntactic as well as semantic differences. On Berman’s analysis, the representation of an example like (11) or (12) would be as in (18).

\[
(18) \quad \text{ALMOST EVERY} \quad \begin{array}{c}
\text{e} \quad \text{x} \quad \text{y} \\
\text{woman(x)} \\
\text{dog(y)} \\
\text{e: sees(x,y)}
\end{array} \quad \begin{array}{c}
\text{x talks to y}
\end{array}
\]

It is most natural to posit an event variable when the antecedent has a stage-level predicate. And the "cases" in the antecedent must be compatible with what is in the consequent. Consider (19)-(21)\(^1\).

(19) Every woman who sees a dog telephones the police.
(20) Every woman who owns a dog telephones the police.
(21) Every woman who owns a dog buys it a license.

(19) is interpreted unproblematically as involving co-binding of an implicit time variable: when a woman sees a dog, then she telephones the police. But if we try to interpret (20) similarly, it is anomalous. Since owning isn’t normally construed as episodic, the antecedent of (20) does not provide a temporal anchor for the telephoning. There is a non-anomalous way to interpret (20), though: if one interprets the verb telephones as a habitual or dispositional generic present, one can interpret (20) (with a Kadmon-type structure as in (15)) as saying that every woman who owns a dog has the property of habitually telephoning the police. In (21), on the other hand, we can indeed construe owns episodically: for each "event" of a woman owning a dog, there is a corresponding event of her buying it a license. All the non-anomalous construals show compatibility between the antecedent and consequent parts of the structure, agreeing in quantifying over events or over
individuals. This correlation is explored further and given an explanation in the work of Kratzer 1989.

The proposals described above may be seen as competing proposals for certain structures in English, but they may also represent distinct strategies, all at least partially correct, for dealing with quantification in different kinds of structures within or across languages. There are clearly several factors interacting in complex ways, and researchers are currently elaborating competing proposals for capturing the appropriate generalizations. At the level of ontology, the most linguistically interesting and relevant distinction in this domain seems to be the shiftable line between "individuals" and "events" or "situations"; some such distinction seems to play a central role in the semantics of many languages, and may play an important role in syntax-to-semantics mapping (see Kratzer 1989). The classification is not one that either nature or our experience imposes directly, but a matter of "cognitive choice."


Stump (1981, 1985) succeeded in turning a seeming morass into the interaction of two or three well-defined structural factors together with the behavior of a certain context-variable occurring in a certain subclass of the structures. The structures Stump dealt with are free absolutes and adjuncts; free adjuncts are illustrated below in (22a,b) and (23a,b).

(22)  (a) Wearing that outfit, Bill would fool everyone.
    (b) Being a master of disguise, Bill would fool everyone.

(23)  (a) Standing on a chair, John can touch the ceiling.
    (b) Having unusually long arms, John can touch the ceiling.

Stump established that there are two fundamentally different kinds of interpretations that these adjunct constructions receive, depending on whether the predicate in the adjunct is stage-level or individual-level.

Sentence (22a) has a paraphrase as a conditional sentence with the adjunct corresponding to an if-clause: "If Bill were wearing that outfit, he would fool everyone." The modal would is an operator that demands a restrictor clause, and the adjunct is interpreted as supplying the restrictor clause, restricting the class of possible worlds to be quantified over.

But in the apparently similar (22b), one can't interpret "being a master of disguise" as an if-clause. Unlike (22a), the adjunct in (22b) is factive. The sentence asserts that Bill is a master of disguise and that he would fool everyone (with the required if-clause left implicit, determined by the context), with a contextually determinate binary relation between these two
propositions. The relation must be a factive one such as because or in spite of. Similarly for (23a) and (23b): one can interpret (23a) with the adjunct understood as playing the role of an if- or when-clause, providing a restrictor in construction with the operator can, but we can’t interpret (23b) as asserting that if or when John has long arms he can touch the ceiling.

Stump showed that only an adjunct containing a stage-level predicate can be interpreted as the restrictor in a tripartite structure whose operator is in the main clause. An adjunct with an individual-level predicate has to be interpreted as a higher factive adjunct on the whole construction, with a contextually determined relation providing the "semantic glue" connecting the adjunct to the main-clause proposition, as in (24). (See Stump 1985 and discussion in Partee 1984b.) The (a) cases are in fact ambiguous and can be interpreted either way.

(24)

```
S
  
"R"
(because)
(or ...)
S[ADJUNCT] (Bill) being a master of disguise

[RESTRICTOR] OP would (implicit) e.g., Bill try to fool everyone

MATRIX Bill fool everyone
```

The question arises whether Stump’s generalization is an idiosyncratic fact of English that just has to be stipulated. Assuming as a working hypothesis that the answer is no, the challenge is to determine what the generalization follows from. One clue is the wide variety of constructions for which the stage/individual-level distinction plays a crucial role, such as the interpretation of bare plurals, adjectival complements of perception verbs, the existential there-construction, and some focus phenomena; see Kratzer 1989 and Diesing 1989.

Now recall that in the case of the proportion problem, a central issue is to clarify the basis for distinguishing between quantification over individuals and quantification over cases, events, or situations. The tendency for clauses with stage-level predicates, whether adverbal clauses or relative clauses within NPs, to go into the restrictor clause of quantification structures seems to be a significant factor in these cases. In the case of Stump’s generalization, the
ability of a subordinate phrase to be interpreted as a restrictor clause also depends on whether it contains a stage-level predicate or not, so the role of stage-level predicates as restrictor clauses with certain kinds of operators seems worth exploring further.

I would like to suggest a tentative general hypothesis that could link both the proportion problem and Stump's generalization to more general issues of syntactic structure and conceptual organization. The hypothesis, which builds on and extends the distinction between D-quantification and A-quantification of Partee, Bach, and Kratzer 1987, is that there are at least two main kinds of quantification ontology, quantification over individuals and quantification over cases, events, or situations, and that these are often interchangeable from a purely truth-functional point of view (as in many examples with every and always), but with a different conceptual organization and a clustering of different typical properties, as listed in (25).

<table>
<thead>
<tr>
<th>(25)</th>
<th>Individual</th>
<th>Case/event/situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Category</td>
<td>NP</td>
<td>S</td>
</tr>
</tbody>
</table>
| (b) Operator | Det | Adv of Q., Modal, Aux, ...
| (c) Sortal | Noun | Verb or verb frame |
| (d) Predicates in restrictors | Indiv.-level | Stage-level |
| (e) Typical restrictors | CNP | if/when-clauses |
| restrictors | Relative clauses | focus-frames |

Looking first at the properties that I suggest typically go together in the case of quantification over individuals: a natural locus of such quantification is the NP, with the determiner as operator and the head noun as the principal sortal predicate. The use of an NP structure, which normally has a unique head noun, tends to give us one principal individual variable to quantify over. In this case we tend to have individual-level predicates as restrictors, adding additional specification of the domain of individuals being quantified over, typically expressed by the common noun phrase and the relative clause. (Note that this clustering of properties is clearly not absolute; I mention various "atypical" cases below.)

The typical clustering of properties in the case of quantification over cases, events, and situations (a grouping that clearly needs further refinement) includes the fact that the quantification is often expressed at the level of the sentence or VP, and that the operator is likely to be expressed by an adverb of quantification or a modal. The principal sortal is often provided by the verb. The domain of quantification, specified by such a sortal and by further restrictors that generally involve stage-level predicates and are typically expressed by if- or when-clauses, thus tends to be episodic, construable as consisting of events or situations or "cases" of some sort that we distinguish
from individuals *simpliciter*. When there is no explicit restrictor, though not only then, a restrictor clause may be provided by the "focus-frame" of the sentence.

The less typical combinations include sentences with an adverb of quantification but an individual-level main predicate like (3a) in section 1 and (13) in section 2, or NPs with stage-level modifiers like (14) in section 2 or as exploited in the riddle song "I Gave My Love a Cherry", sample lines from which are in (26).

(26) How can there be a cherry that has no stone? ... A cherry when it’s blooming, it has no stone.

In (27) I sketch a slightly elaborated version of a tripartite structure in which I indicate not only samples of the different sorts of operators and domains of quantification discussed above, but also a place in the structure that could be thought of as corresponding to "factive" background material, establishing certain characteristics of the context within which the quantificational structure is to be interpreted, and which are thus outside the scope of the quantificational operator. I suggest that this is an appropriate location for the individual-level adjuncts in the Stump examples. At some level at which explicit and implicit material are integrated, it might also be thought of as the place in the structure where the context or conversational background resides, or a place into which such contextual material may freely be accommodated.

(27)

```
S
   
(Conv. Background)
   In view of ..., Given ...
```

<table>
<thead>
<tr>
<th>Operator</th>
<th>Restrictor</th>
<th>Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>every</td>
<td>domain of individuals</td>
<td>possibilities</td>
</tr>
<tr>
<td>would</td>
<td></td>
<td>episodes, situations, cases</td>
</tr>
<tr>
<td>often</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

While I suggest that such clusters of typical properties have some linguistic and conceptual reality, I don’t want to put too much weight on them in
specific analyses. Different parts of specific linguistic structures can force, constrain, or influence what parts of a syntactically given structure are to be interpreted as playing what role in such tripartite structures (see e.g. Diesing 1989, 1990) and what further properties the operator and the restrictor in such a structure must have in a given case (see e.g. Kratzer 1980).

One natural challenge that confronts these suggestions is the following: if my hypothesis is at all correct, why should these two very different kinds of quantification be so frequently interchangeable? English certainly allows us to express many things either way, and different languages seem able to prefer one kind over the other, or to do without D-quantification altogether. My answer to this challenge is to appeal to the fact that the notion of an individual and the notion of a case or situation or episode or event are both ontologically extremely broad notions, and not mutually exclusive. Insofar as we can think of cases, for instance, as tuples of entities, we can identify individuals with their singletons or one-tuples. Even for more temporal notions of episode or event or situation, there is no obstacle in principle to regarding an individual as a situation or an event; some individuals come with natural spatiotemporal boundaries, and for those that don’t, there are various ways that spatiotemporal boundaries can be contextually supplied or imposed. So a system designed for quantifying over cases or situations or events could certainly be used for quantifying over individuals, since there are various ways of taking what we might have been thinking of as an individual and reconstruing it as a case or situation or even event. And on the other hand, there’s nothing that can’t be an individual. The phenomenon of nominalization, particularly as analyzed by Chierchia and Turner (Chierchia 1982, 1984, Chierchia and Turner 1987), clearly demonstrates the human tendency to treat every robust ontological type as also a potential subtype of the type of entities. The paradigmatic individual may be a person or a physical object, but an individual can be an encounter, a situation, a property, a state of affairs. Not only nominalizations but even the range of lexical nouns suggests that there’s no limit on what can be an individual.

Now I want to try to apply that general perspective to the puzzle of what Stump’s generalization follows from. I assume, perhaps controversially, that there is no independent syntactic distinction between the two kinds of adjuncts, so that their different behavior should be predictable on the basis of the semantic difference between the stage-level and individual-level predicates that head them plus the contribution of the adjunct construction itself.

This leads me to suggest the following as the beginning of an explanation. As far as the basic rules of the grammar go, all adjuncts can be interpreted either as higher factive modifiers or as restrictors; I consider this to be a species of non-restrictive and restrictive modification on the level of the sentence. Then since adjuncts containing stage-level predicates can in fact be
used with both kinds of interpretation, we just need to find a basis for arguing that adjuncts with individual-level predicates cannot be interpreted as restrictor clauses. A promising line of argumentation of this sort would be that when free adjuncts are interpreted as restrictors, they must restrict events or situations; and perhaps we can argue that individual-level predicates don’t restrict events or situations.

In examples (22a-b), for example, one could say that "(Bill) wearing that outfit" can restrict a set of possible situations understood with a spatiotemporal dimension as well a dimension of possible worlds. But "(Bill) being a master of disguise", where the individual-level predicate can express a property of Bill but not a property of episodes, is perhaps incompatible with the requirement that the restrictor clause restrict cases or situations.

But here is a possible counterargument. If we use explicit if-clauses, as in (28a-b), the sentences are perfectly fine regardless of whether they contain an individual-level or stage-level predicate. So how can we suggest an argument based on semantic anomaly to rule out the possibility of interpreting (22b) as (28b), when adjuncts play the role of if-clauses in restrictor clauses and (28b) is perfectly fine?

(28)    (a) If he were wearing that outfit, Bill would fool everyone.
        (b) If he were a master of disguise, Bill would fool everyone.

Here is a reply. Free adjuncts are not semantically identical to if-clauses, even though sometimes paraphrasable. The lack of tense/mood marking on adjuncts may well be a significant property. As a tentative suggestion, I would suggest (although this itself needs explanation) that stage-level adjuncts are neutral with respect to the distinction between if and when as well as to the distinction between indicative and subjunctive. They are thus like potentially counterfactual when-clauses.

Adjuncts containing individual-level predicates are in principle neutral among these distinctions as well, but lack when-paraphrases. The proposals of Kratzer 1989 provide part of the basis for this last fact. Kratzer 1989 has given many arguments for the claim that stage-level predicates actually have an argument place for a spatiotemporal location or event or situation (a "Davidsonian" argument) which individual-level predicates lack. She also makes the independently plausible assumption that natural language quantification must be non-vacuous: in any tripartite quantificational structure, the operator must bind at least one variable which occurs in both the restrictor and the matrix.

If we accept those features of Kratzer’s analysis, then I think we have the basis for the kind of argument I was looking for above. If any adjunct can be mapped into the restrictor part of the structure in (27) or (24) by a general syntax-to-semantics interpretation rule, but as a restrictor must restrict
spatiotemporal locations (which fits the fact that the only if-clause paraphrases are of the if=\textit{when} type), then the restrictor-clause interpretations of the adjuncts in (22a-b) would be as in (29a-b), where \textit{l} is the variable for Kratzer’s proposed spatiotemporal argument.

(29) \begin{enumerate}
\item (a) $\lambda l[\text{wearing (Bill, that outfit, l)}]$
\item (b) $\lambda l[\text{master-of-disguise (Bill)}]$
\end{enumerate}

Since the individual-level predicate in (29b) does not have a spatiotemporal argument place, the result violates the prohibition against vacuous quantification, which explains its anomaly.

The fact that restrictive adjuncts must restrict spatiotemporal locations or situations also seems to solve a problem raised by Angelika Kratzer (personal communication): why is (30b) not a perfectly good paraphrase of (30a)?

(30) \begin{enumerate}
\item When a linguist knows a foreign language, she usually knows it well.
\item #Knowing a foreign language, a linguist usually knows it well.
\end{enumerate}

A \textit{when}-clause can provide a restrictor for any quantificational operator, whether the relevant "cases" are event-like or merely tuples of individuals; but an adjunct has to have an event or spatiotemporal argument to restrict. The analogy between restrictive adjuncts and relative clauses may be instructive here: the adjunct is forced to do its restricting at the sentence level, and cannot be construed as if it were simply a moved relative clause. A paraphrase of (30a) can be constructed, as in (31a), by putting the restrictor content in the form of a relative clause; these can even be counterfactual as in (31b), but the quantificational structure involves quantifying over individuals (possible individuals in (31b)), not over episodes.

(31) \begin{enumerate}
\item A linguist who knows a foreign language usually knows it well.
\item A man who had unusually long arms would be able to touch the ceiling.
\end{enumerate}

This point may be reinforced by noting the function of the "sort-shifters" identified by Stump which serve to turn individual-level predicates into stage-level ones or vice versa, illustrated in (32).

(32) \begin{align*}
\text{a teacher, / as a teacher,} \\
\text{having long arms, / with long arms,} \\
\text{being drunk, / drunk,
} \end{align*}
Although it might seem at first as though the stage-level versions like *with long arms* would give us a way to use adjuncts to quantify over individuals, in fact they are used to quantify over stages of a single individual, much like the *cherry* example (26).

In conclusion, I do not claim to have offered a full account of either the proportion problem or Stump's generalization; both are complex phenomena involving several interacting phenomena, and the former in particular is the object of much current research and debate. But I hope to have shown that quantification, as it becomes better understood, is a valuable diagnostic domain to work with, because it is strongly if not exclusively tied up with sentence grammar. Just as early work in generative semantics emphasized the need to take account of quantifier scope and binding in theories of grammar, quantification can also help shed light on where implicit "event arguments" and the like enter the grammar proper, and open up interesting areas of research on the interaction of syntactic and semantic constraints on possible forms and their interpretations.

Notes

*The research for and writing of this paper were supported by NSF grant BNF-8719999. I am grateful for ideas and suggestions to my co-principal investigators Emmon Bach and Angelika Kratzer, to our research assistants and students in two quantification seminars, especially Steve Berman, Molly Diesing, Hotze Rullmann, Roger Schwarzschild, Alison Taub, Paul Portner, Kai von Fintel, Virginia Brennan, Yutaka Ohno, and Noriko Kawasaki, consultants Eloise Jelinek, David Gil, Maria Bittner, and Ken Hale, visitors to the University of Massachusetts Helen de Hoop, Henriette de Swart, Kozo Iwabe, and Young-Sup Kim. Additional research support for this work came from a research exchange fellowship from IREX with funds provided by NEH and USIA. Thanks also to colleagues and students at the Charles University in Prague, especially Petr Sgall, Eva Hajicová and Tomás Vlk.*

1. I owe example (21) to Frances Ingemann.

References

Partee, B. (1989) "Binding Implicit Variables in Quantified Contexts, CLS 25


Rooth, M. (ms.1989) "Indefinites, Adverbs of Quantification, and Focus Semantics", ms., AT&T Bell Laboratories, Murray Hill, N.J.


The ecology of a semantic space

Eric Pederson
University of California, Berkeley

In recent years, a growing number of researchers have been examining the recurrent extensional structures of grammatical constructions. Grammatical markers typically extend historically from function to function along often predictable pathways. These (near) universal pathways of development extend out from a prototype function via metaphor, image schema transformation, simple analogy, or various other mechanisms. Combining these pathways, we can create a network of potential functional extensions for each prototype construction. The nature of these extensions is well-treated in other works. For example, Kemmer (1988) provides a significant study of the typical extensions of reflexive markers to "middle" functions such as books selling themselves well and branches breaking themselves in the wind. Each language that has a prototype reflexive (He hit himself) will have some coherent subset of all possible, node-by-node extensions along this network (cf. Pederson 1991).

While we can accurately describe the diachronic (and possibly synchronic) extensions of a grammatical marker in this way, we have no means to motivate the particular subset of all possible extensions that one language selects. In other words, we still need to ask why does a construction extend one way in one language and another way in another language? Why, for example, is the English reflexive construction relatively limited in its functions while the Spanish reflexive marker has extended to middle, passive, and even impersonal constructions? I see four likely factors affecting each language's particular pattern of extensions:

1. Idiosyncrasy. Any language may have a particular set of extensions because it is a unique language and not all changes are strictly determinable. However, we should always attempt to determine a richer causal explanation for change in a language. If we cannot explain something, it should not be for lack of trying.

2. Type of marking. We may notice that, e.g., affixed reflexive markers seem to be more richly polyfunctional than reflexive pronouns. Theories of iconicity (cf. especially Haiman 1980, 1983) might be invoked to explain this. On the other hand, polyfunctionality can also be a simple function of age of the marker. Older markers will have had more time to become affixal (assuming that to be the most general morphological drift) and more functions may be acquired largely as a function of time. Such an account would still fail to fully motivate cross-linguistic differences and similarities.

3. Areal influence. A language may extend grammatical constructions by borrowing a use of a similar construction or it may calque a neighboring language's construction which uses a similar morpheme. Many examples of this can be found (e.g. the Dutch reflexive and its origin and divergence from the Standard German reflexive, cf. van der Leek 1991). While interesting, I will not consider such cases in this paper.
4. Influence from other constructions in the same language. This paper considers the systemic influence of various constructions, "neighboring" in the same general area of type of expression, on the functional range of individual constructions.\(^2\)

I examine the semantics of several valence affecting constructions in a small range of typologically contrastive languages. Each of these constructions can be used to describe the same event which we might characterize as highly transitive (cf. Hopper and Thompson 1980, Rice 1987). That is, an agent does something to a patient, and the patient undergoes some change of state. For example, an event where someone acts upon a branch, which breaks in the process (cf. Talmy 1976 and 1985 for detailed discussions of the subparts of a causative event).

Each of these constructions, by denoting the same real-world event, may have the same truth-value. A speaker chooses from the set of constructions to construe the event or scene as having a particular structure. The structure ascribed by the speaker may, of course, be different from reality or it may emphasize just select aspects of the event. Though the constructions may have considerable functional overlap, each construction asserts a specific nuance for which the substitution of another construction would be less appropriate.

Consider Modern Hebrew, which, in addition to intransitives, has a three-way distinction among those constructions which do not specify agent. (For a summary of the *binyan* system, cf. Berman 1979a. The following Hebrew examples and semantic analysis are from Berman 1979a:1-2,11 and 1979b:3.) Functionally, these constructions vary according to the construal of agency. The active impersonal (1) marks the existence of an agent (+human) but declines to specify that agent.

1) ye'argenu šney cvatim bekarov
   (they)-will-organize two teams soon

The agentless passive (2) "[focusses] on the patient, which [it serves] to foreground – and although passives imply the logical existence of an agent, the latter’s role is deliberately ignored" (Berman 1979b:19).

2) šney cvatim ye'urgenu bekarov
   two teams will-be-organized soon

Contrastively, the reflexive or middle paradigm (3) characterizes the event as occurring autonomously – that is, with only internal causation and no external agent.

3) šney cvatim yit'argenu bekarov
   two teams will-get-Ref-organized soon

Semantically and structurally, middle paradigm constructions are quite similar to the simple intransitive constructions as in (4).
4) hacvatim yit'argenu 
   the-teams will-organize(Intr) to-them

Similarly, for explicit agent constructions, Modern Hebrew may choose between periphrastic causative constructions (5), agent-patient causative/transitive verbs (6), and oblique-agent passives (7).

5) hama'ase asa oti xole
   the-deed made me sick

6) hama'ase hexli oti
   the-deed sickened me

7) hakad nişvar al ydey haxatul
   the-vase was-broken by the-cat

Causative constructions highlight an agent external to the event. Transitive verbs express the agent without any special emphasis. "Demoted" agent passives mention an agent, but downplay its importance to the event.

We can organize the relationships between these constructions by plotting them on a two dimensional space where their location indicates the construals they best represent. This space represents the range of expressions dedicated to causal/inchoative events. The horizontal dimension of this space is the core argument expression of the number of participants (or transitivity in short) — that is, how many participants are construed as relevant. Prototype causatives are quite highly transitive. Similarly prototype simple transitive verbs are highly transitive. On the other end of this scale, prototype reflexives are low transitivity: they are used to explicitly deny a second participant to the scene (It was myself that I hit) or to assert that one participant fills two roles. Prototype passives are fairly low in this sense of transitivity (cf. Shibatani 1985): they delete (or in some languages may demote) agents from reference. However, passives do not deny the existence of an outside agent, as do prototype reflexives, so I place them not as far towards the low end of the transitivity scale. Prototypical impersonal constructions are middling transitive in that they express an agent, but so generically as to not reflect a fully salient participant. Finally, simple intransitives are definitionally low in transitivity. This horizontal dimension seems critically important for distinguishing the functions of these constructions since speakers appear particularly keen to express the number of relevant participants in an event.

The vertical dimension of this space represents the degree to which the construction construes the grammatical subject of the construction as responsible for the event. Does the construction answer the question "Whose fault is it?" (or "Who gets the credit?")? Did the branch break because the subject was leaning on it (I made the branch break)? Did it break because it was flimsy (The branch just broke itself in my hands)? Or is it irrelevant what caused it; the speaker is only concerned with the result (The branch broke)? The notion of responsibility
appears conceptually central to any discussion of change of state and causation.\(^3\) Thus causatives prototypically mark exact ultimate responsibility on the subject. With reflexive constructions, the subject is construed as responsible, or at least the reflexive marks that there is no other agent or actor responsible for the event (*I hit myself, no one else did*). Conversely, passives usually assume the subject is the patient of actions of a distinct responsible party (which may sometimes be expressed in a grammatically demoted form). Simple transitives and intransitives are relatively neutral for this parameter. Impersonal constructions may attribute responsibility to an agent which is not a distinct and explicit referent, but they often seem used to beg the question of who is responsible.

![Diagram of semantic space of change of event constructions](image)

**Fig. 1** The semantic space of change of event constructions With prototypes for each construction in place (X indicates little expressed regions.)

So in Figure 1, I plot each of these constructions according to the values on these two dimensions of their prototypes. Note that there can be any number of other dimensions with which to differentiate the uses of these constructions. A useful third dimension could represent the constructions’ use for switching or maintaining topic. However, a third dimension would complicate the diagram immensely and these two dimensions are the most critical for characterizing the contrasts of the prototypes of these constructions. Note that these common constructions almost entirely fill the semantic space except for the spots marked with X’s. There appears to be a universal need to have basic constructions to express construals for all regions in this space not marked with X’s.\(^4\) Note that two
diagonal dimensions naturally follow from the horizontal and vertical values: Highly transitive constructions with responsible subjects have agent subjects; whereas passives have patient subjects. Reflexives/middles are associated with internal causation. Causatives, many transitives, and agentive passives suggest external causation.

In Figure 2, I plot the approximate range of expressive construal for the various Hebrew constructions. The space is tidily divided among the constructions in a way closely resembling the array of presumed universal prototypes of Fig. 1. To wit, all primary regions are expressible by one construction or another. The overlap areas represent areas where a speaker might vacillate between two constructions to represent that particular degree of construal. Thus, each construction has its own core and extended region in the space and slight overlap is tolerated.

![Diagram of Hebrew constructions]

This introduces an analytically useful metaphor:

*a semantic space is populated by various constructions which stand in an ecological relationship to one another.*

We can best apply this ecology metaphor by examining languages which do not regularly use all of these basic grammatical constructions to represent each prototype area in the space. English (Fig. 3), with its relatively impoverished range of reflexive functions and its flexibility to use simple verbs transitively and intransitively, uses simple intransitives for "middle" functions typically marked in other
European languages with the reflexive. In ecological terms, the simple predicate construction claims a large percentage of the semantic space, inhibiting the presence of other constructions around that space. Conversely, we could say that the absence of a reflexive-derived middle motivates the use of the simple intransitive for this function.

I don’t circle relatively minor constructions in these figures, but include them to suggest new or less prevalent constructional "species" which may eventually vie for more wide-spread use. For example, the get-passive often combines the qualities of passive with a notion of partial responsibility of the subject (cf. R. Lakoff 1971, Chapell 1980).

These synchronic examples represent ecological systems in a fairly stable state: there are no important unexpressed regions, and there is minimal overlap or synonymy between constructions. Effectively, there is little strong competition. As such, this space looks similar to Anderson’s "maps" of the semantic spaces of evidentials (1986) and perfects (1982). As with his diagrams, diachronic change can be represented by redrawing the regions expressed by each construction to reflect changes in function. This ecological model goes beyond mapping however. Since much of this causative / inchoative space is necessarily filled, we can actually determine competition between constructions to express various regions and see how the ecology of the space helps effect the extensional shifts of the

Fig. 3 English
constructions.

Now consider Figures 4 and 5 for Tamil. Over the last 2,000 years there has been a noteworthy decline in the frequency and functional range of simple intransitive Tamil verbs. Along with this, there has been a rise in the frequency and range of transitive verbs. This can be explained in terms of the overall shifts in the ecologically-governed causative/inchoative space. In oldest Classical Tamil (Fig. 4 circa 200 AD), if an event was represented as dyadic, a morphological causative was typically suffixed to one of the many intransitive verbs. For example, kāṃpi "show" from kāṇ "see". Further, the language had effectively no reflexive construction — though it had a logophoric pronoun. It occasionally used passive-like constructions through the regularized use of verbs such as paṭu "to suffer" and peru "to experience, beget", but patient subject functions were by-and-large expressed by simple bare stem intransitives. Thus events of washing, breaking, and finding (be-found) were all expressed as basically intransitive. (Classical Tamil also had a few "defective" verbs, which, like impersonals, could only inflect for a generic third person neuter singular subject.)

![Diagram of subject-responsibility and causation](image)

Fig. 4 Classical Tamil

Morphological causatives, though common and productive, were complex morphophonemically, and one morpheme had been phonologically reduced in many verbs to simple gemination or devoicing of the root-final consonant or the following tense morpheme. For example, mēy-nt- "graze-Past-, X grazed"
becomesmeye-tt- "graze-Past-, Y put X to pasture". Thus the common causative construction had very little ability to markedly emphasize that an event should be construed as highly causative. Serial verbs (vai, "to place purposefully" or paññu / cey "to do") were suitably grammaticized by metaphor to create an emphatic causative construction highly marking that the grammatical subject and no other participant was responsible (perhaps contrary to expectations) for the event.

8) ... vëntarai aññakarum parandalai aññkap paññi ...
kings-Acc frightening battle. ground wither-Inf do-AvP
"and (he) made the kings suffer on that terrible battle field"
(Pûranârû 25:5-6, c. 200-300AD)

This paraphrastic causative came into competition with the morphological causative. This competition and the phonological inelegance of the various causative allomorphs eventually created a situation where the old morphological causative verbs ceased to be productive (one could no longer causativize any intransitive). Such verbs eventually became reanalysed as monomorphemic transitive verbs.

During the latter part of this gradual transition,8 the serial verb koḷ "to take and retain" (cf. Pederson 1990) came to be associated with reflexive contexts (action done for/to oneself). This grammaticized as a full-fledged reflexive marker and has, over the centuries extended inexorably along some of the paths of extension which reflexive markers typically take (cf. again, Kemmer 1988, Pederson 1991), pushing down the range of the simple intransitive verb. Recently, the reflexive construction has begun to acquire a deagentive function which construes an event as having internal causation or at least no animate responsible agent:

9) năn katavait tîrantēn. "I opened the door."
   I door-Acc open-Ps-1s (from Pederson 1990)

10) katavu tîrantukenatatu. "The door opened by itself [or wind]."
    door(Nom) open.Avp-Ref-Ps-3sn (Deagentive/Anti-causative)

This is in contrast to the still used simple intransitive which is more neutral with respect to responsibility:

11) katavu tîrantatu. "The door opened. [Cause unspecified]"
    door(Nom) open-Ps-3sn

Since a crowded region of semantic space will not maintain multiple expression for long, the range of the simple intransitive has been reduced to some simple inchoatives (agent-neutral) and patient subjects.

Most recently, after continual contact with European languages developed (and passive-laden prose needed translation), Tamil has renovated the old passive-like verb pâtu to use as a passive construction.9 Its use is still restricted to specific genres, such as academic discourse, but its entry into that region of the semantic space may well contribute to a further reduction of the functional range
for intransitives. All these developments give us a state of the system something like Figure 5.

![Diagram of Modern Tamil](attachment:Modern_TamilDiagram.png)

**Fig. 5 Modern Tamil**

While the *potential* range of a construction in a language depends upon the type of the construction and its particular history, we have seen how the *actual* range of usage is determined in large part by the ecology of the overall system of expressively related constructions. To borrow a term from evolutionary theory, relatively stable systems can have "punctured equilibrium". We have seen this come from:

1. reanalysis of morphemes, (Tamil causative)
2. loss of productivity, (Tamil causative)
3. innovation of new constructions, (Tamil reflexive)
4. language contact (Tamil passive)

This punctured equilibrium often precipitates fundamental changes among the sets of competing constructions.

While I have focussed on the semantic space of causative / inchoative events, a similar ecological perspective (where changes are seen as the result of competition in an often changing semantic environment) could apply to the study of other interactive sets of grammatical constructions. I suggest modals, tense and aspect systems, case marking, and spatial markers as promising candidates.
Notes

1. I owe much of this paper to the fruits of discussion with Dan Slobin, Eve Sweetser, Leonard Talmy, and Ceil Toupin. I must credit Kausalya Hart for her patience and assistance with my faltering Tamil. Errors, I claim as my own.

2. I must provide a few important disclaimers for the following discussion: 1) This analysis is deliberately simplified. Space is limited, and I am trying to present a somewhat complicated theoretical mechanism rather than apply that mechanism to all possible data. Further complications must be considered under separate work. 2) I have thus far only tested "accusative" languages with my approach — and I have not tested enough of those to make any strong universal claims. 3) For space limitations, I don't provide example sentences for all of what I diagram. While you will need to take much on faith, greater exemplification would prove little since any invalidity to my approach would only be demonstrated by counter-examples, which I urge the readers to provide for themselves. None of the data I am drawing on is particularly controversial. 4) The diagrams represent thumbnail sketches of phenomena plotted somewhat impressionistically. It should be possible, though difficult, to draw such diagrams to represent exact results of statistical analysis.

In short, this paper focuses less on particulars and more on the systemic principles I wish to present.

3. For a discussion of the centrality of the notion of responsibility in common sense reasoning about causal events, cf. chap. 3 of Hart and Honoré 1985. (My thanks to Ceil Toupin for this reference.)

The notion of responsibility should not be confused with volitionality. One can non-volitionally be responsible for an event, and inanimate objects may by their nature be construed as responsible for an event's occurrence. In general, speakers tend to seek out a volitional (or at least human) agent from among the set of factors necessary for an event onto which to ascribe responsibility. This need not be the case, especially when there is something unusual about an inanimate's characteristics.

4. One can see that we seldom both express two or more relevant participants of a causative event and have the non-responsible one be subject (the XXX area). The agentive passive is closest to this but the agent is seldom expressed as a core argument. Additionally, the XX area of medium transitivity (one explicit participant and one less-than-explicit participant implied) seldom is expressed with constructions which imply a responsible subject. A causative with a deleted or backgrounded patient or causee would approximate such a construction.

5. I leave out the various English impersonal constructions. No one of them is used with great frequency and each has a different nuance beyond the scope of this study.

6. The language could be said to be shifting over from a fundamentally intransitive language (in the sense of Nichols 1982) toward being a more transitive
language.

7. Readers who have some knowledge of Classical Tamil will, I hope, excuse the simplified discussion of the causatives. Both -pi/-vi and -tt- can be treated as causative morphemes, -tt- (both suffix and alternate inflectional paradigm) being older and minimally productive by the time of the earliest records.

8. Exact dating of the use of koḻ as a reflexive marker is difficult. Karthikeyani (1980) claims tenth century inscriptions have koḻ used reflexively. However, such inscriptions as I have been able to examine do not unimpeachably use koḻ as a reflexive, but only as a less than fully grammaticalized metaphorical "taking" or as an aspectual auxiliary. I urge caution ascribing reflexive function to such an early period.

9. Interestingly, the other passive-like verbs which were common in Classical Tamil have not been renovated. One was apparently sufficient to emulate the European model.

References


The Perfective Paradox:  
Or How to Eat Your Cake and Have it Too  

Mona Singh*  
The University of Texas

1 Introduction

Consider sentence 1 in Hindi and sentence 2 in Japanese. These sentences are self-contradictory in English but perfectly normal in Hindi and Japanese respectively. As I will explain below, the natural readings of these and similar sentences are difficult to account for on the basis of most extant theories of aspect. I call this phenomenon the perfective paradox.

1. māine aaj apana kek khaaaya aur baakii kal khaūgaa  
   I-ERG today mine cake eat-PERF and remaining tomorrow eat-FUT  
   I ate my cake today and I will eat the remaining tomorrow

2. wakashita keredo wakanakatta  
   boil-PERF though boil-NEG  
   I boiled the water, but it did not boil

Traditionally, the perfective aspect is considered quite uncontroversial—a sentence in the perfective is also simply taken to describe an event which has reached an end. The interaction with Vendler’s (1967) classification of situation types is seen to be straightforward. For example, the two component theory proposed by Smith can accommodate various interpretations of the perfective (Smith 1990). It has been pointed out that in many languages the perfective can be used for at least the non-stative situation types, namely achievements, activities and accomplishments (Smith 1990) Sometimes it can be used with states as well, as is the case in English. For achievements, the perfective is more natural than the imperfective and signifies the corresponding change of state. For activities, the perfective describes their cessation at any arbitrary point—that is how activities end. For accomplishments, the picture is taken to be equally unremarkable: the perfective simply emphasizes the natural ending of the situation. Unfortunately, this picture, though compelling, is not quite correct. Specifically, in several languages, notably Hindi and Japanese, the perfective form may be used with verbs that usually denote an accomplishment to mean that the described situation has reached an endpoint, but not the natural one that would signify the accomplishment.

Intuitively, however, this data is hardly surprising. Accomplishments have features of both achievements and activities: they call for extended action and also have a natural endpoint. Clearly, the action done as part of an accomplishment may either be taken all the way or stopped at any point. In a language like English the use of a simple verb (SV) by default indicates that the natural endpoint is reached, but an additional description is required to state that the action was stopped arbitrarily.
These additional descriptions may, for example, be in the form of determiners (e.g. ‘some of the cake’). By contrast, some other languages have distinct forms to emphasize the natural and arbitrary endpoints respectively. In Hindi, simple verbs are used for arbitrary endpoints, and compound verbs for natural endpoints (see Singh 1990). For example, the ungrammaticality of the subordinate clause in sentence 3 indicates that the natural endpoint of the event has been reached. In Japanese, the verb constellation includes the verb for ‘to finish’ to imply completion.

3. * main kek khaa liya, jo bacaai hai wo ram khaayegaa
   I-ERG cake eat take-PERF what remain is that Ram eat-FUT
   I ate the cake and Ram will eat the rest

In this paper, I discuss the perfective paradox in the context of Hindi. The perfective in Hindi is intimately connected with the phenomenon of *compound verbs*, which I will now describe briefly.

Compound Verbs (or CVs for short) are constellations of verbs of the form [Verb1 + Verb2]. Verb1 is called the main verb and carries the semantic weight of the CV. Verb2 is called the explicator verb and loses its independent meaning to a large extent. Two paradigm examples are

4. dekh-aa
   see-PERF (a simple verb)

5. dekh li-ya
   see take-PERF (a compound verb)

In a theory of aspect like the one of Smith, it is possible to give the following sort of analysis (Smith 1990). One could say that the compound verb constellations can be used only to refer to the natural endpoints of event types. This would mean completion for accomplishments and change of state for achievements. For any arbitrary endpoints only the simple verb can be used—therefore activities never occur with a compound verb constellation. The analysis seems to work quite well. However, there is one shortcoming. Such a framework does not allow us to distinguish between sentences 6 and 7 below, since both of them are accomplishments. There is a clear meaning distinction in sentence 6 between the simple verb form and the compound verb form. The perfective compound verb in sentence 6 implies that both the cakes were eaten entirely; the simple verb form has no such implications. In sentence 7, however, there is no distinction—neither presuppositional or implicational—between the simple and compound verb forms: both imply that the entire mass of one and a half cakes was eaten.

6. laRke-ne do kek khaaye / khaa liye
   boy-ERG two cake eat-PERF / eat take-PERF
   The boy ate two cakes (partly) / entirely

7. laRke-ne deRh kek khaayaa / khaa liya
   boy-ERG one and a half cake eat-PERF / eat take-PERF
   The boy ate one and a half cakes entirely
I submit that any solution to the perfective paradox must also take care of data such as the above. In this paper, I discuss a more subtle approach to the semantics of events that provides just the right concepts to take care of this paradox. The approach is based on a lattice-theoretic account of event and object structure as developed recently by Manfred Krifka (In Press) The resulting approach is not only general but elegant as well.

2 The Theory

In this theory, both events and objects are treated as elements in two lattice structures. Many interesting properties of thematic relations between events and objects then correlate with mathematical properties of the two different lattice structures. The semantics of cumulative and quantized reference is given in terms of a semantic operation for joining two individuals to form a new individual. Cumulative and quantized predicates do not correspond exactly to mass nouns and count nouns. For example, both 'beer' and 'apples' are mass nouns since beer combined with more beer is still beer, and adding more apples to apples yields apples. On the other hand, 'a glass of beer' and 'five apples' are quantized. Suppose there are two entities to which the predicate 'a glass of beer' applies. This predicate then cannot apply to their collection. The case of 'five apples' is similar. These concepts have been expressed formally below.

It turns out from these theories that typically a quantized argument yields a telic verbal predicate and a cumulative argument yields an atelic verbal predicate. However, most interestingly for us, in Hindi we can get an atelic interpretation for quantized arguments as we saw in sentence 1. This is not quite an atelic reading, but rather what I call a partitive telic: I return to this point in §3.5 below.

The lattice-theoretic analysis of events assumes events and objects to be two non-overlapping sorts of entities characterized by predicates $E$ and $O$ respectively. The extensions of $O$ and $E$ have the structure of a join semi-lattice without a bottom element. Let $\sqcup$ be the operation of join; $\sqsubseteq$ be the relation of part; $\sqsupseteq$ be the relation of proper part; and $\circ$ be the relation of overlap. The following properties of object and event predicates are important for this paper.

1. **Cumulativity** is the property of atelic events.
   \[ \forall P[CUM(P) \leftrightarrow \forall x, y[P(x) \land P(y) \rightarrow P(x \sqcup y)]] \]

2. **Quantization** is the property of telic events.
   \[ \forall P[QUA(P) \leftrightarrow \forall x, y[P(x) \land P(y) \rightarrow y \not\sqsubseteq x]] \]

Thematic relations can be modeled as homomorphisms from objects to events that preserve the lattice structure. The following properties of thematic relations are used later in this paper (see Krifka (In Press) for details).

1. **Summativity** provides the connection between thematic relations and the join operation. For example, two events of eating an apple yield an event of eating two apples.
∀R[SUM(R) ↔ ∀e, e', x, x'[R(e, x) ∧ R(e', x') → R(e ∪ e', x ∪ x')]]

2. **Uniqueness of objects** relates every event to an object; e.g., the eating of an apple is related via the patient role to a specific apple.

∀R[UNI-O(R) ↔ ∀e, x, x'[R(e, x) ∧ R(e, x') → x = x']]

3. **Uniqueness of events** relates every object to a single event; e.g., for a particular apple there can be only one event of eating it.

∀R[UNI-E(R) ↔ ∀e, e', x[R(e, x) ∧ R(e', x) → e = e']]

4. **Mapping to objects** maps, for example, every part of eating an apple to a part of an apple.

∀R[MAP-O(R) ↔ ∀e, e', x[R(e, x) ∧ e' ⊆ e → ∃x'[x' ⊆ x ∧ R(e', x')]]]

5. **Mapping to events** goes the other way: it maps, for example, every part of an apple to a part of the event of eating it.

∀R[MAP-E(R) ↔ ∀e, x, x'[R(e, x) ∧ x' ⊆ x → ∃e'[e' ⊆ e ∧ R(e', x')]]]

6. Using these primitive notions we can define another useful relation, namely **graduality**. The *graduality* of a thematic relation means that the object is subjected to the event in a gradual manner. For example, *writing a letter* or *eating an apple* affect their objects gradually.

∀R[GRAD(R) ↔ UNI-O(R) ∧ MAP-O(R) ∧ MAP-E(R)]

### 3 Perfectivity and Quantization

A change in the reference type of nominals can affect the temporal constitution of the entire construction. In German, progressivity may be marked by a partitive case marking on the patient (Križka (In Press)). The lattice-theoretic approach provides an explanation of this phenomenon since it allows a change in reference type of the nominal predicate to affect the temporal constitution of the entire construction. E.g., in German a “partitive-patient” relation yields a progressive reading as in *an einem Fisch essen*. On the other hand, there are also cases (like Slavic languages) where a verbal predicate operator affects the meaning of the nominal predicate; e.g., perfectivity in Czech is compatible only with a quantized object. In sentence 8 below the perfective is acceptable only with the quantized reading of the patient.

8. ota vypil vino
   Ota drink-PERF wine / the wine
   Ota drank *wine / the wine

   Like Slavic languages, Hindi does not have any articles to mark definite or indefinite NPs. This gives rise to two kinds of ambiguity. For one, bare NPs may be interpreted as indefinites or definites; e.g., *vaaIn* can mean ‘wine’ or ‘the wine’. Secondly, count nouns have two further kinds of ambiguity; e.g., apple in Hindi can
not only mean 'an apple', 'the apple', but also 'some mass of apple' or 'any part of an apple'. This ambiguity is one of the causes of the perfective paradox. Let us return to sentence 1 above where the object kek is definite. The fact that it is grammatical is a result of the interpretation of 'cake' as 'a part of the cake'.

3.1 Classification of Thematic Roles

In Figure 1 below, properties of thematic relations, as described in §2, have been used to classify the predicates. This figure presents the results of considering four classes of predicates in Hindi in both their simple and compound verb forms.

<table>
<thead>
<tr>
<th>Example</th>
<th>SUM</th>
<th>GRAD</th>
<th>UNI-E</th>
<th>CV-SV distinction</th>
</tr>
</thead>
<tbody>
<tr>
<td>write a letter</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>read a letter</td>
<td>X</td>
<td>X</td>
<td>—</td>
<td>X</td>
</tr>
<tr>
<td>see a cat</td>
<td>X</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>win a race</td>
<td>X</td>
<td>—</td>
<td>X</td>
<td>—</td>
</tr>
</tbody>
</table>

Figure 1: Classification of Thematic Roles

The first category is of predicates that have the properties of summativity, graduality and uniqueness with respect to events, e.g., write a letter.

9. usne ciThii likhii par puurii nahii kii
   he-ERG letter write-PERF but complete NEG do-PERF
   He wrote a letter but did not complete it

10. usne ek ciThii likhii par puurii nahii kii
    he-ERG one letter write-PERF but complete NEG do-PERF
    He wrote one letter but did not complete it

11. usne ciThii likh lii (* par puurii nahii kii)
    he-ERG letter write take-PERF (but complete NEG do-PERF)
    He wrote a letter (* but did not complete it)

12. usne ek ciThii likh lii (* par puurii nahii kii)
    he-ERG one letter write take-PERF (but complete NEG do-PERF)
    He wrote one letter (* but did not complete it)

Members of the second class of event predicates mentioned in Figure 1 have the properties of summativity and graduality, but lack the property of uniqueness with respect to events (e.g., read a letter).

13. usne ciThii pārRhii par puurii nahii kii
    he-ERG letter read-PERF but complete NEG do-PERF
    He read a letter but did not complete it
14. usne ciThii parRh lii (* par puurii nahii kii)
   he-ERG letter read take-PERF (but complete NEG do-PERF)
   He read a letter (* but did not complete it)

   In both these cases, the thematic relation is gradual. It appears that the uniqueness of events does not have any effect on whether the reading is partitive or completive. Sentences 10 and 12 use the quantizer ek, but they behave just like sentences 9 and 11 respectively which do not have a quantizer. Therefore, it is clear that in cases where the thematic relation is gradual, the SV-CV distinction is not related to quantization. Both for bare NPs and quantized NPs, a CV is used when completion has to be specified; a simple verb is used when a partitive reading is intended.

   The next class is different with respect to the graduality of the thematic relation. Sentences 15 and 16 are examples of predicates with the property of summativity, but lacking the properties of graduality and uniqueness with respect to events.

15. usne billii dekhii
   he-ERG cat see-PERF
   He saw a cat

16. usne billii dekh lii
   he-ERG cat see take-PERF
   He saw the cat

   These sentences show that the distinction between the CV and the SV forms in this class of event predicates is related to the distinction between definities and indefinites. The CV forces a definite reading of the bare Noun Phrase. The analysis of CVs so far is that when the event in question is not gradual as in sentences 15 and 16, then the CVs mark the nominals as being definite.

   The other class of predicates I would like to discuss lacks graduality but has the properties of summativity and uniqueness of events. Consider sentence 17 below.

17. usne res jiitii / jiit lii
   he-ERG race win-PERF / win take-PERF
   He won the race

   In this sentence there is no aspectual distinction between the forms with a CV or an SV. The use of the CV contributes to pragmatic factors like speaker empathy but that is not of importance here. Therefore we may conclude that predicates that lack graduality do not have any aspectual distinction corresponding to the part-complete relation of gradual patients.

   The previous case of sentences with gradual thematic relations is more interesting, so I return to it now.

3.2 Mass Nouns

Consider the following examples that have mass head nouns.
18. usne biar pii
   he-ERG beer drink-PERF
   He drank beer (cumulative reading)

19. usne do gilaas biar pii/ pii lli
   he-ERG two glasses beer drink-PERF / drink take-PERF
   He drank two glasses of beer (quantized reading)

20. usne biar pii lli
    he-ERG beer drink take-PERF
    He drank the beer (some salient amount)

These examples show that Hindi marks explicitly quantized cumulative nominals in a special way. We saw in sentences 9 and 10 that quantization of count nouns was not a crucial factor in the part-complete distinction—both explicitly quantized and non-quantized count nouns interacted similarly with CVs. But, if the cumulative noun is not quantized then the SV is used, while if it is quantized there is no distinction between the SV and CV form—both would imply a completive reading. Sentence 20 shows that even when the patient is not explicitly quantized the CV form transfers the property of quantization to the nominal. Therefore the interpretation of sentence 20 is that of his having drunk some salient quantity of beer.

3.2.1 Count Nouns Behaving as Mass Nouns

It is possible to have an NP with a count head noun behave as a mass noun. For example,

21. usne deRh seb khaaye (* par puure nahī khaaye)
    he-ERG one-and-a-half apples eat-PERF (but entire NEG eat-PERF)
    He ate one-and-a-half apples (* but did not eat all of them)

22. usne deRh seb khaa liye (* par puure nahī khaaye)
    he-ERG one-and-a-half apples eat take-PERF (but entire NEG eat-PERF)
    He ate one-and-a-half apples (* but did not eat all of them)

Here there is no aspectual distinction between the SV-CV versions. Even though the head noun is a count noun, by giving it a "non-discrete" determiner, we make it behave like a measure of a mass noun. I.e., one-and-a-half apples is on par with one gallon of wine, and no proper part of the eating of one-and-a-half apples is an eating of one-and-a-half apples. And consequently the CV-SV distinction does not apply to such constructions.

3.3 Count Nouns

However, in the case of explicitly quantized count nouns as in sentence 23 below, the preferred verb form is the CV as in 24. What is interesting about these examples is that sentence 24 has the interpretation that the agent has eaten all the five apples entirely. The interpretation of sentence 23 could be that the agent ate a part of each of the five apples. This is diagramed in Figure 2.
23. usne paan seb khaaye
   he-ERG five apples eat-PERF
   He ate five apples (not entirely)

24. usne paan seb khaa liye
   he-ERG five apples eat take-PERF
   He ate five apples (entirely)

![Diagram of five circles]

Figure 2: Partitive Reading for Plurals

This shows that when the head noun is a count noun, the default form of the verb that is required is a CV form. The interpretation of this corresponds to that of the English perfective. The SV form can be felicitously used only for a partitive reading (defined formally in §3.4 below).

3.4 Partitive Telicity

A useful property for the definition of partitive telicity is that of ATOM. This applies to an element and a predicate and says that the element is an atom of the predicate; i.e., the predicate applies to the given element but not to no part of it. ATOM applies to count nouns but not to mass nouns. It can be defined formally as

- $\forall z, P[ATOM(z, P) \leftrightarrow P(z) \land \neg \exists y[y \sqsubseteq z \land P(y)]]$

Using this we can define a new relation, is an atomic part of $(\sqsubseteq_A)$ as the part relation $(\sqsubseteq)$ restricted to atoms. Let $\delta$ denote the nominal predicate of a given sentence, and let $\alpha$ denote the verbal predicate. Also let $\theta$ denote the thematic relation. Now we can formally define the constraints on thematic relations that are captured by SVs and CVs, respectively. As already described, SVs allow readings in which their arguments are not entirely consumed, while CVs require that their arguments be involved as a whole. Thus the thematic relation for CVs is the standard one, while that for SVs is more complex:

- $\theta_{pd}(e, z) \leftrightarrow \forall y[y \sqsubseteq_A e' \rightarrow \exists z', z[z \sqsubseteq y \land e' \sqsubseteq e \land \theta(e', z)]]$

The sentence predicate in each case would be as follows.
SV: $\lambda e \exists z [\alpha(e) \land \theta_{pt}(e, z) \land \delta(z)]$

CV: $\lambda e \exists z [\alpha(e) \land \theta(e, z) \land \delta(z)]$

E.g., let $\alpha$ be 'eat', $\delta$ be 'five apples', $\theta$ be the usual patient relation, and $\theta_{pt}$ be the patient relation under the partitive telic reading. Then the SV sentence predicate applies to an event in which parts of each of five apples are eaten, while the CV version applies only to those in which five apples are eaten entirely—this corresponds to the English perfective. $\theta_{pt}$ is defined in terms of the atomic parts of the given object—note that count nouns but not mass nouns have atomic parts.

3.5 Partitive versus Progressive

It might seem from the discussion above that the partitive reading for objects (as given in sentences with SVs) coincides with the progressive reading of the corresponding events, as was the case in German. However, this is not the case here. The definition of the progressive is given in terms of an operator PROG (Krifka (In Press)). This says that $\text{PROG}(\alpha)$ is true of event $e'$ iff it is a part of an $\alpha$-event, $e$.

- $\text{PROG} = \lambda P \lambda e' \exists e [P(e) \land e' \subseteq e]$

Consider, once again sentence 23 about the eating of five apples. This sentence is true only if parts of each of the five apples are eaten. The corresponding progressive, on the other hand, would be true if any part of any apple was being eaten. In general, the progressive is true of all subevents of the eating event (e.g., when only one apple has been bitten into); the partitive telic is not true of just any such subevent, but only of those subevents in which parts of all five apples are eaten.

The partitive reading seems atelic (as I mentioned in §2) but is not quite that. This is because the eating of five apples in sentence 23 has a natural final endpoint, namely that of biting into the fifth apple. It must be noted, however, that this endpoint is not unique, as it would be in ordinary telic events: as long as there are some parts of the five apples left, one can continue to eat them. Thus it has features of both telic and atelic events. As remarked in §2, I term this reading the partitive telic reading.

4 Conclusions

We can conclude from this discussion that the requirements for the perfective form of the SV do not correspond to those for that of the CV, which behaves like the perfective in English. Unlike the CV perfective, the SV perfective, which I have dubbed the partitive telic, does not require that its object participate entirely. And unlike the progressive, it suggests completion.

It seems to me that the perfective paradox is the result of the lack of articles and the ambiguity that arises due to the various interpretations of bare NPs. However, the complexity of the verbal forms makes it possible to disambiguate between
different interpretations to a large extent. The perfective marker and CVs provide interesting insights into the relation between nominal reference and aspectual marking.

Endnotes

* I am deeply indebted to Manfred Krifka for comments and discussions.

1. I should clarify that the verb form in sentence 1 is indeed the perfective. It is well-known that the progressive and the habitual are the only imperfective forms available in Hindi (e.g., see Dahl 1985). Consider sentence 25 with the perfective form of the verb and sentence 26 with the progressive form.

25. laRkaa baag mē calaa (* aur ab tak cal raha hai)
   boy park in walk-PERF (and now till walk PROG is)
   The boy walked in the park (*and is still walking)

26. laRkaa baag mē cal raha tha (* aur ab tak cal raha hai)
   boy park in walk PROG (and now till walk PROG is)
   The boy was walking in the park (and is still walking)

Since the coordinate clause in sentence 25 is unacceptable, while that in sentence 26 is acceptable, it is clear that the action in sentence 25 is completed, whereas the action in sentence 26 is not.

References


Path to Realization: a Typology of Event Conflation
Leonard Talmy  
State University of New York, Buffalo

0. Introduction. Three basic findings converge synergistically in this study. The first finding is that, in the underlying conceptual organization of language, there is a major inclusive type of event complex -- composed of certain kinds of simplex events in certain relationships -- that perhaps universally is also amenable to conceptualization as a single fused event and, accordingly, to expression by a single clause. While Talmy (1972, 1985) had described such an event complex and its "conflation" into a single clause in the expression of Motion, it is now possible to demonstrate the existence of a generic category of such event complexes that is both extensive and fundamental and to characterize the general structure of the event complex in rather precise terms.

The second finding is that one of the simplex events within the event complex, the "framing event", can now be seen to encompass as many as five otherwise quite distinct types of event. While Talmy (1985) had seen a parallelism in this regard between Motion and change of state, it is now evident that there are three further types of framing event with parallel semantic and syntactic properties: events of "temporal contouring", "action correlating", and "realization". Of these further types, action correlating is newly introduced here, while temporal contouring and realization have been discussed previously but neither as framing events nor even as conceptually separable events.

The third finding is that languages fall into two typological categories on the basis of where they characteristically express the schematic core of the framing event -- in the verb or in a satellite to the verb. While this typology formed part of the typology for Motion that was set forth in Talmy (1985), it is now apparent that it extends as well to all five types of framing event and, indeed, thereby constitutes the main evidence for grouping the five event types together.

For an immediate idea of the kind of phenomenon to be treated, the following English sentences illustrate event complexes with each of the five types of framing event in turn. And they illustrate the typological category in which the schematic core of the framing event is expressed by a satellite. Thus, this satellite -- here, the final verb particle -- expresses: the path in an event of motion, as in *The ball rolled in*; the aspect in an event of temporal contouring, as in *They talked on*; the changed property in an event of state change, as in *The candle blew out*; the correlation in an event of action correlating, as in *She sang along*; and the fulfillment or confirmation in an event of realization, as in *The police hunted the fugitive down*. Further display of concrete examples such as these is delayed until section 2, since the task of section 1 is to set forth the theoretical framework and parameters that the remainder of this study's analysis will depend on.
1. The Macro-Event. 1.1 Conceptual Structure of the Macro-Event.

1.1.1 Conceptualization of an Event. By the operation of very general cognitive processes that can be termed conceptual partitioning and the ascription of entityhood, the human mind in perception or conception can extend a boundary around a portion of what would otherwise be a continuum, whether of space, time, or other qualitative domain, and ascribe to the excerpted contents within the boundary the property of being a single unit entity. Among various alternatives, one category of such an entity is perceived or conceptualized as an event, a type of entity that includes within its boundary some portion of a qualitative domain in correlation with some portion of time, that possibly rests on a primitive phenomenological experience which may be characterized as dynamism, and that is probably both foundational and universal in human cognition.

1.1.2 Event Complexes. An entity that can be cognized as an event can vary over a range of structural complexity, which can be characterized both conceptually and in terms of its linguistic expression. At the simpler end, a simplex event is an event that can be expressed by a single clause, and that cannot be further partitioned with the resulting subportions also able to be cognized as events and expressed by single clauses. (What can qualify as a simplex event varies in certain respects from language to language.) Next in scale is an event that can in many languages be expressed by -- to use the traditional terminology -- a complex sentence consisting of a main clause and a subordinate clause that has an adverbial subordinating conjunction, and that -- to adapt the syntactic terms -- could be called a complex event which is in turn partitioned into a main event and a subordinate event (both simplex events in the simplest case), together with the relation that the subordinate event bears to the main event (cf. Talmy 1978a, 1978b). Finally, a coordinate event would consist of two equipotent events and the relation between them, and could in many languages be expressed by a coordinate (or, in traditional terms, a compound) sentence consisting of two clauses and a coordinating conjunction.

1.1.3 Conceptual Conflation of Events. There appears to be a general cognitive process at work in language whereby an event that under a more analytic conceptualization would be understood as complex and represented by a multiclause syntactic structure can be alternatively conceptualized as simplex and represented by a single clause. To adapt the term "conflation" introduced for similar purposes in Talmy (1985), this process of reconceptualization can be called the conceptual conflation of events. For one seemingly universal instantiation of this process, a simplex event is frequently considered in conjunction with a set of additional events so related as to form a causal chain, prototypically initiated by a volitional and intentional Agent, which ends up causing the simplex event (cf. Talmy 1972). This more analytically conceived complex of events can be correspondingly represented by a syntactic complex of distinct clauses. But the same content can also be conceptually conflated so as to be experienced as a unitary simplex event and represented as a single (agentive)
clause. To illustrate with an unintentional Agent (or "Author": cf. Talmy 1983), a particular referent can be conceptualized as a causal sequence of separate events and be so represented syntactically, as in The aerial toppled because I did something to it, or it can be reconceived as a neo-simplex event expressed monoclaually as in I toppled the aerial.

1.1.4 Macro-Event as Conceptual Conflation of Complex Event. A cross-linguistic comparison strongly suggests that there is a fundamental and recurrent category of complex event that is prone to conceptual conflation and representation by a single clause, a type here to be termed a macro-event. Thus, on the one hand, the macro-event is expressed by a single clause and is regularly conceptualized as a unified simplex event. On the other hand, a closer syntactic and semantic analysis of such single clauses shows that their conceptual structure and content closely resemble that of a complex event of a certain class and, indeed, they can often be alternatively expressed by complex sentences. The difference in conceptualization can be illustrated by the complex sentence The candle went out because something blew on it which represents part for part the main event, subordinating relation, and subordinate event of a complex event, as contrasted with the single-clause sentence The candle blew out, which expresses virtually the same contents with the same structuring and interrelation of components but which presents this complex as a unified simplex event, a macro-event.

The category of complex event that is amenable to conceptual conflation as a macro-event is highly constrained. In the appropriate complex event, the main and subordinate events must be of certain distinct classes, and these events must bear certain relations to the whole complex and to each other. Ultimately, one of the major concerns here is the cognitive issue of event cohesion or fusion -- i.e., with respect to conceptual content, the amount of it, the kinds of it, and the relations among different portions of it that can or must be present together in consciousness to permit the experiencing of that content as a single coherent unit of eventhood -- but the present version of this paper affords little space to address this issue directly.

1.1.5 The Framing Event. As a simplex event considered by itself, the main event within the macro-event has the character of delineating a certain type of schematic structure in any of a particular set of organized conceptual domains, and for this reason can be referred to as a domain-schematizing event. At this stage of investigation, there are clearly five types of domain schematization that the main event can represent, as established by their comparable semantic and syntactic treatment across languages. These five types are: an event of motion or location in space, an event of contouring in time (aspect), an event of change or constancy among states, an event of correlation among actions, and an event of fulfillment or confirmation in the domain of realization. Each domain schematization has the following structural features: 1) a particular type of figural entity, 2) certain types of ground elements, 3) a process by which the
figural entity either makes a transition or stays fixed with respect to the ground elements -- what will be called the activating process, because it is the component that is conceived as contributing the factor of dynamism to the event -- and 4) a relating function that sets the figural entity into association with selected ground elements. With respect to these features, since the figural entity of any particular framing event is generally set by context and since the activating process generally has either of only two values, the portion of the framing event that most determines its particular character and distinguishes it from other framing events is the schematic pattern of association with selected ground elements into which the figural entity enters. Accordingly, either the relating function alone or this together with the particular selection of involved ground elements can be considered the schematic core of the framing event -- what will be called the core schema -- and will be seen to figure crucially in the syntactic mappings described below.

To particularize this general characterization for an event of motion in space, the figural entity is a physical object, the ground elements are (features of) physical objects that constitute locations, the activating process of transitioning among these elements constitutes motion, and the relating function that associates the figural entity with the ground elements among which the transition takes place constitutes the path. The core schema here will then be either the path alone or the path together with its ground locations.

While the preceding describes the autonomous or absolute character of the main event as a domain-schematizer, the main event also has a relative role in relation to the whole macro-event. Relative to the whole, it is the main event that provides or determines certain overarching patterns, a role that is compatible with the characterization that the main head performs a framing function with respect to the macro-event, so that it can be aptly termed the framing event. Thus, the framing event provides for the whole macro-event the overarching conceptual framework or reference frame within which the other included activities are conceived of as taking place. The framing event thus determines at least the overall temporal framework and thereby determines the aspect of the sentence that expresses the macro-event; it also generally determines the overall spatial framework or some other reference frame pertaining to another conceptual domain. Further, it is the framing event that determines all or most of the argument structure and semantic character of the arguments overall within the macro-event, as well as determining all or most of the syntactic complement structure in the sentence that expresses the macro-event. In addition, the framing event constitutes the central import or main point -- or what will here be termed the upshot -- relative to the whole macro-event. That is to say, it is the framing event that is asserted in a positive declarative sentence, that is denied under negation, that is demanded in an imperative, and that is asked about in an interrogative.
Within the macro-event, the main event can also manifest certain framing functions relative to the subordinate event. First, the framing event can anchor the subordinate event within, or link that event to, the overarching conceptual framework that it determines. Second, the framing event can bear to the subordinate event the relation of "structurer" in a cognitive process of conceptual structuring. In particular here, the framing event can act as an abstract structure that is conceptually imposed on the subordinate event acting as a "substrate". Generally in this relationship, the semantic character of the framing event is more that of an abstract schema while that of the subordinate event tends to be more substantive or perceptually palpable. For this reason, the content of the subordinate event is often more vivid than that of the framing event and, thus, might draw much or at times even more attention to itself, and in this respect might seem semantically more primary than the framing event. Nevertheless, it is the framing event that frames, shapes, provides the upshot, and is determinative of the further factors outlined above.

1.1.6 The Supporting Event. Considered autonomously by itself, the kind of event that constitutes the subordinate event is probably most frequently and perhaps prototypically an aspectually unbounded activity, but other event types do occur and, for that reason, no single semantic characterization can as yet be given. But for its relative roles, the subordinate event can be held to constitute an event of additional circumstance in relation to the macro-event as a whole and to perform a function of support in relation to the framing event. As to this latter relationship, the subordinate event can be seen to fill in, elaborate, add to, or motivate the framing event, functions that are consonant with the cited notion of "support", and so can aptly be termed the supporting event. The general supportive relation that the supporting event bears to the framing event will be termed the S-relation. In any given usage, however, this general relation is particularized as one out of a certain set of specific relations that include: Precursion, Enablement, Cause, Manner, Concomitance, Purpose, and Constitutiveness -- the most frequent among these being Cause and Manner. There is of course a correspondence between the particular function that the framing event performs with respect to the supporting event, and the particular S-relation that the supporting event bears to the framing event. Thus, when the framing event acts as a substrate shaper with respect to the supporting event, the latter will generally bear a Constitutive relation to the former. And when the framing event serves to anchor the supporting event within its framework, the supporting event usually has a Manner or Concomitance relation to the framing event.

1.1.7 The Components of the Macro-Event. Figure 1 diagrams the components of the macro-event and their relations, showing as well the known domain-schematizations of the framing event and some particularizations of the S-relation.

1.2 Mappings of the Macro-Event onto Syntactic Structures.
Figures 1, 2, 3

(A term in braces {} indicates the role of the absolute element above it, relative to the next larger structural unit)

Figure 1: conceptual structure of the macro-event

\[
\begin{align*}
\text{Causal-Chain} & \quad \text{Event (framing)} & \text{S-relation} & \quad \text{Event (supporting)} \\
\{\text{Agent}\} & \{\text{Motion}\} & & \{\text{Precursion}\} \\
& \{\text{temporal contouring}\} & & \{\text{Enablement}\} \\
& \{\text{state change}\} & & \{\text{Cause}\} \\
& \{\text{action correlating}\} & & \{\text{Manner}\} \\
& \{\text{realization...}\} & & \{\text{Concomitance}\} \\
& & & \{\text{Purpose}\} \\
& & & \{\text{Constitutive...}\}
\end{align*}
\]

Figure 2: syntactic mapping of Motion-type macro-event in verb framed languages

\[
\begin{align*}
\text{Motion} & \quad \text{Path} & \quad \text{Object} \\
\text{Adjunct / Sat} & \quad \text{S-relation} & \quad \text{Event (supporting)} \\
\text{V} & & \{\text{Ground}\}
\end{align*}
\]

(Adjunct: e.g., adverbial subordinate clause or phrase)

Figure 3: syntactic mapping of Motion-type macro-event in satellite-framed languages

\[
\begin{align*}
\text{Motion} & \quad \text{Path} & \quad \text{Object} \\
\text{Sat} & \quad \text{S-relation} & \quad \text{Event (supporting)} \\
\text{V} & & \{\text{Ground}\}
\end{align*}
\]

NB: In Figures 2 and 3, the Ground may join with the Path for expression in either the V or the Sat
1.2.1 The Typology of Verb-Framed and Satellite-Framed Languages. The existence of the macro-event as a cognitive unit and its specific conceptual structuring may be universals of linguistic organization. But the world’s languages generally seem to divide into a two-category typology on the basis of the characteristic pattern in which the conceptual structure of the macro-event is mapped onto syntactic structure. To characterize it initially in broad strokes, the typology consists of whether the core schema is expressed by the main verb or by the satellite.

As proposed and developed in Talmy (1972, 1985), the satellite to the verb -- or simply, the satellite, abbreviated as Sat -- is the grammatical category of any constituent other than a nominal complement that is in a sister relation to the verb root. The satellite, which can be either a bound affix or a free word, is thus intended to encompass all of the following grammatical forms, which traditionally have been largely treated independently of each other: English verb particles, German separable and inseparable verb prefixes, Latin or Russian verb prefixes, Chinese verb complements, Lahu non-head "versatile verbs" (cf. Matisoff 1973), Caddo incorporated nouns, and Atsugewi polysynthetic affixes around the verb root. The rationale for recognizing the satellite as a grammatical category is that it captures an observable commonality, both syntactic and semantic, across all these forms -- e.g., its common function across one typological category of languages as the characteristic site of the core schema.

Languages that characteristically map the core schema into the verb will be said to have a framing verb and to be verb-framed languages. Included among such languages are Romance, Semitic, Japanese, Tamil, Polynesian, most Bantu (for the qualification, cf. Schaefer 1987), most Mayan, Nez Perce, and Caddo. On the other hand, languages that characteristically map the core schema onto the satellite will be said to have a framing satellite and to be satellite-framed languages, and included among them are most Indo-European minus Romance, Finno-Ugric, Chinese, Ojibwa, and Warlpiri. Generally, a framing satellite expresses the core schema alone, whereas a framing verb conflates expression of the core schema together with that of the activating process.

With the schematic core of the framing event located thus, where does the supporting event appear? Languages with a framing satellite regularly map the supporting event into the main verb, which can thus be called a supporting verb. On the other hand, languages with a framing verb map the supporting event either onto a satellite or into an adjunct, typically an adpositional phrase or a gerundive-type constituent -- terms which in this usage can now also have the word "supporting" placed before them. Figures 2 and 3 diagram these relationships for the case where the framing event is an event of Motion.

1.2.2 Introductory Illustration. For an introductory illustration of these relationships, we contrast English, a basically satellite-framed language, though not
the most thoroughgoing example of the type, and Spanish, a verb-framed language. Consider first a non-agentive sentence with a motion-type framing event: in the English *The bottle floated out*, the satellite *out* expresses the core schema -- here, the path -- while the verb *float* expresses the supporting event, which here bears the S-relation of Manner to the framing event. By contrast, in the closest Spanish counterpart, *La botella salió flotando* ‘The bottle exited floating’, the verb *salir* ‘to exit’ expresses the core schema -- again, the path -- while the gerundive form *flotando* ‘floating’ expresses the supporting event of Manner.

Comparably for an agentive sentence with a state-change type of framing event, in the English *I blew out the candle*, the satellite *out* expresses the core schema of the framing event -- transition to a new state, that of being extinguished -- while the verb *blow* expresses the supporting event, one with the relation of Cause to the framing event. But in the closest Spanish counterparts, *Apagué la vela de un soplo* / *soplándola*, ‘I extinguished the candle with a blow / blowing-it’, the main verb expresses the transition to a new state while the adjunct, either the prepositional phrase or the gerundive, expresses the supporting event of Cause.

1.3 Aims of This Paper. The ground-level aim of this paper is to extend the typology introduced in Talmy (1972, 1985), which dealt only with Motion and some change of state. The present paper now further demonstrates that, in any language, the syntactic site -- verb or satellite -- where Path is characteristically expressed is also to a great extent where aspect, state change, action correlation, and realization are characteristically expressed. This typological finding is then prima facie evidence that languages treat these five types of domain schematization -- which might otherwise seem to bear little relation to each other -- as a single conceptual entity, the framing event, which this paper then further aims to establish as a recognized component of cognitive-linguistic organization. Further observation finds that the framing event is characteristically expressed within a single clause that systematically includes certain additional kinds of content -- the supporting event and its relation to the framing event. Such single clauses are seen to correspond cross-linguistically in expressing the same type of event complex -- viz., a complex event that is conceptualized as a single event by a process of conceptual conflation -- here termed the macro-event, which this paper then further aims to establish as an additional recognized component of cognitive-linguistic organization.

In this initial brief version, the present paper does not treat a number of further important issues. Among such issues are the relations between what serves for language as a single integrated event and the single events of perception or of general cognition; the precise requisite factors that permit conceptual integration of an event complex for linguistic expression; the particular differences between languages as to which types of complex events are amenable to such conceptual fusion; the differences between languages as to which
relations the supporting event can bear to the framing event; and the competing claims for the presence or absence of consistency in the conceptual organization within any single language, claims that the comparable treatment of the five types of framing event might bear on.

2. A Motion Event as the Framing Event. The first type of framing event we consider, possibly its conceptual prototype, is an event of physical motion or stationariness, with this range designated by the capitalized term Motion. As the general domain-schematizing structure is particularized for a Motion event, the figural entity is a physical object whose path or site requires characterization and which has the role of Figure in relation to the whole event. The activating process, when it consists of a transition by the Figure among the ground elements, is what is normally understood as translational motion and, when it consists of the Figure’s staying fixed with respect to the ground elements, is stationariness. The relating function comes out as the Path, i.e., the path followed or the site occupied by the Figure with respect to the selected ground elements. And the ground element is a second physical object functioning as a reference point with respect to which the Figure’s path or site is characterized and which bears the role of Ground in relation to the whole event. The core schema of the Motion event is generally the Path alone in some languages, such as English, but it is generally the combination of Path + Ground in other languages, such as Atsugewi (cf. Talmy 1972, 1984). In accordance with the general mapping typology, the core schema is characteristically expressed by the main verb in verb-framed languages and by the satellite in satellite-framed languages.

For illustration, (1) represents the conceptual structure of four Motion-type macro-events that vary as to the absence or presence of an agentive causal chain and as to whether the S-relation is Manner or Cause. The concept of motion is represented by the form MOVE or -- when this results from an agentive chain -- by the form AMOVE. Each macro-event is seen to map in accordance with the two typologically contrasting patterns onto a sentence of Spanish, representing verb-framed languages, and onto a sentence of English, representing satellite-framed languages.

(1) a. non-agentive 1. S-relation: Manner
[the bottle MOVED in to the cave] DURING-Which [it floated]

Eng: The bottle floated into the cave.

Spn: La botella entró flotando a la cueva.

"The bottle entered (MOVED-in) floating to the cave."

2. S-relation: Cause
[the bone MOVED out from its socket] AS-A-RESULT-OF [(something) pulled on it]

Eng: The bone pulled out of its socket.

Spn: El hueso se salió de su sitio de un tirón.

"The bone exited (MOVED-out) from its location by a pull."
b. agentive  1. S-relation: Manner

[I_A MOVED the keg out of the storeroom] DURING-WHICH [I rolled it]

Eng:  I rolled the keg out of the storeroom.
Spn:  Saqué el barril de la bodega rodandolo.
      "I extruded (A_MOVED-out) the keg from the storeroom rolling it."

2. S-relation: Cause

[I_A MOVED the ball in to the box] BY [I kicked it]

Eng:  I kicked the ball into the box.
Spn:  Metí la pelota a la caja de una patada.
      "I inserted (A_MOVED-in) the ball to the box by a kick."

As the preceding translations show, English often has Path verbs that can directly gloss the Spanish Path verbs, but their use is generally less colloquial and they are largely borrowed from Romance languages, where they are the characteristic type, as is the case, for example, with all the following intransitive Path verbs: enter, exit, ascend, descend, pass, cross, traverse, circle, return, arrive, advance, join, separate.

One of the reasons for considering a domain-schematizing event as a "framing" event can be seen in the present examples. Readily able to serve as a Manner-type supporting event is a class of aspectually unbounded activities that I have called events of "self-contained Motion", i.e., Motion of elements that, at a certain larger scope of granularity, do not change their average position in space. This class includes: rotation, oscillation, local wander, dilation/contraction, wriggle, and rest. Such self-contained motion events can be referred to in isolation, e.g., in The ball rolled over and over (in the magnetic field) [rotation] or The ball bounced up and down (on one spot) [oscillation]. On the other hand, in macro-event sentences like The ball rolled / bounced down the hall, we see the self-contained motion occurring concurrently with and as a modifying manner for an event of translational motion, i.e., motion where the Figure object does change its average position in space (here, the ball’s moving down the hall). Such a translational motion event co-defines a rectilinear framework in space, within which the activity of the self-contained motion has now come to be anchored -- hence, one justification for calling the main event a "framing" event.

As noted earlier for English, the core schema for a Motion event is usually just the Path alone, but we should present some cases where it is the combination of the Path plus the Ground, both to illustrate the majority pattern for Motion in languages like Atsugewi and to model the majority pattern for the other framing event types in most languages including English. Thus, in English, the whole of the Path + Ground concept ‘to the home of entity_1/entity_2’ maps onto the satellite home as in He drove her home, where it can mean either ‘to his home’ or ‘to her home’. For a case with a more abstract Ground, the
Path + Ground combination ‘to a position across an opening’ -- following the typology -- can in English map onto the satellite shut, but in Spanish must map into the verb together with the ‘motion’ notion, as in cerrar ‘to close’, as shown in (2). Since this example can be interpreted as either motion or change of state or as something in between, it can serve to show a relatedness or gradience across the different framing-event types.

(2) [I MOVED the door TO POSITION-ACROSS-OPENING] BY [I kicked it]

Eng: I kicked the door shut.
Spn: Cerré la puerta de una patada.
"I closed the door by a kick."

3. Temporal Contouring (Aspect) as the Framing Event. The second type of framing event we consider is an event of temporal contouring -- that is, of aspect where such aspect is conceptualized as an event. The structural template of domain schematization can apply to a temporal contouring in either of two ways. For the general case, the figural entity is an event’s degree of manifestation -- e.g., whether it is fully manifested, not manifested, or at reduced manifestation as in a process of tapering off -- which is set into a fixed association with selected points or periods of time that thus function as the ground elements. Thus, if drawn on a graph with time progressing toward the right and degree of manifestation increasing upward, an iterated accomplishment would have the temporal contour of a series of flattened inverted U-shaped curves.

For the kind of aspect in which an object gets progressively more affected, an alternative schematization brings forth this object’s progression of affectedness in accordance with a particular temporal contour. Thus, here, the figural element is the affected object itself; the activating process is this object’s progression through time --- represented below as "MOVE", where the quote marks are to suggest that temporal progression can be conceptualized as an analog or metaphoric extension of motion through space; the relating function indicates the direction of association that the affected object has with the temporal contour (e.g., taking it on or letting it go) and the ground element is the temporal contour itself. The core schema then consists of these last two components together.

This analysis is based on evidence that the organization of conceptualization for linguistic expression sets temporal contouring into analogy with Motion as part of a broader cognitive analogy by which temporal structuring is conceptualized as paralleling spatial structuring. This conceptual analogy motivates a syntactic and lexical analogy: to a great extent in a language, aspect is expressed in the same constituent type as Path (+ Ground), and often by homophonous forms. Thus, in accordance with the general typology, the core schema of an event of temporal contouring appears in the main verb in verb-framed languages but in the satellite in satellite-framed languages, as exemplified below
respectively by Spanish and by German.

The event of temporal contouring lives up to its name as framing event relative to the whole macro-event in that it determines the overall temporal framework within which the whole, including the supporting event, has occurrence. The event of temporal contouring also performs a framing function with respect to the supporting event in the sense, described earlier, of acting as a shaping structure imposed on a substrate and, as with the earlier generalization, has a more abstract character by contrast with the more tangible character of the supporting event. Correlatively, the S-relation that the supporting event bears to the event of temporal contouring is a constitutive relation, in effect "filling in" the conceptual region outlined by the temporal contour.

Now, why should the temporal contour, i.e., the sheer manifestational envelope, of an activity be itself treated in conception and in linguistic expression as a separate event, perhaps as a process of imposition, as evidenced by the common existence of lexical verb roots comparable to the English begin, finish, continue, repeat, etc.? The main cognitive basis may involve force dynamics (cf. Talmey 1988b), i.e., the general and language-based conceptual system pertaining to force exertion, opposition, resistance, and overcoming, where the temporal contouring event, as Antagonist, overcomes the so-conceived intrinsic temporal character of the substrate activity, as Agonist. By this interpretation, for example, a substrate activity's basic tendency to continue on in a steady state can, by a process of temporal imposition, be overcome so as to yield a cessation or completion; or another activity's basic tendency toward termination can be overcome to yield a continuation of the activity; or another activity's basic tendency to occur once and then cease can be overcome to yield an iteration. A further cognitive basis for the agentive form of such impositional processes might be an individual's own developmental experience of the exercise of agency, in particular, in marshalling one's efforts to effect a desired pattern in an activity, as by increasing or decreasing one's pace, initiating, persevering, or quitting. But whatever the validity of event status for aspect or of any cognitive bases for such a status, the linguistic facts are that aspect is frequently expressed as the main lexical verb, and often characteristically so in verb-framed languages.

3.1 Spanish / German Aspect Mapping Contrasts. Presented in (3) are a number of different aspeсtual concepts and examples showing the mapping of each such concept into the main verb in Spanish⁴ but in German onto a satellite -- a satellite either in the narrower sense or in the broader sense that includes particles and adverbials in construction with the verb. While both these languages, and possibly all languages, express aspeсtual notions both with the lexical verb and with constituents adjoined to the verb, one or the other of these loci usually tends, as here, to predominate in degree of usage and in colloquiality. English itself, while perhaps leaning toward the satellite side, does have a fair number of colloquial aspeсtual verbs, e.g., from the set of examples below,
finish, continue, use(d to), wind up, be (-ing). But it should be noted that, of these, the first three are borrowings from Romance, where they are the native type, and that this pattern may parallel the borrowing of Path verbs also from Romance, as discussed earlier, so that insofar as English presents a mixed typological picture, it does so comparably in both the domains of Motion and temporal contouring.

Represented for the aspect type in (3a) is a suggested conceptual structure for the macro-event, in which the core schema consists of a positive direction of association, represented as TO, plus a 'terminative' temporal contour, represented as COMPLETION. The English construction to completion, as in I wrote the letter to completion, may be taken to directly reflect the two components making up the core schema, the relating function and the ground element, and so to exhibit syntactically a parallelism between a temporal contour and a Path + Ground. Otherwise, in the expected pattern, German expresses the whole core schema in a framing satellite and the supporting event in a supporting verb, while Spanish expresses the whole core schema in a framing verb and the supporting event in a verbal complement.5

The inclusion of the progressive aspect forms in (3j) is meant to suggest that in Spanish and German the progressive is syntactically treated not as a special form but in accordance with the same pattern as the other aspectual forms -- an interpretation buttressed by the fact that in both languages, unlike English, such progressive forms are optional in the present and exist beside simple present forms: Escribe una carta, and Sie schreibt einen Brief.

(3) a. 'to finish Ving' / 'to V to a finish / to completion'
   Spn: terminar de V-Inf
   Gmn: fertig-V
   [I "MOVED" the letter TO COMPLETION] CONSTITUTED-BY [I was writing it]
   Terminé de escribir la carta.
   Ich habe den Brief fertiggeschrieben.
   'I finished writing the letter.' / 'I wrote the letter to completion.'

b. 'to V again / re-V'
   Spn: volver a V-Inf
   Gmn: wieder-V / noch mal V
   Volvi'a comer. / Lo volvi'a ver.
   Ich habe noch mal gegessen. / Ich habe ihn wiedergesehen.
   'I ate again.' / 'I saw him again.'

c. 'to have just Ved'
   Spn: acabar de V-Inf (acabar: imperfective forms)
   Gmn: gerade V (perfect forms)
Acabo de comer. / Acababa de comer cuando llegó.
Ich habe gerade gegessen. / Ich hatte gerade gegessen, als er kam.
‘I just ate.’ / ‘I had just eaten when he arrived.’

d. ‘to continue to V / ‘to still V’
Spn: seguir V-Ger
Gmn: (immer) noch V
Segue durmiendo. / Seguíá durmiendo cuando mire.
Er schläft noch. / Er hat noch geschlafen, als ich nachschaute.
‘He’s still sleeping. / He was still sleeping when I looked in.’

e. ‘to customarily V’
Spn: soler V-Inf
Gmn: normalerweise V (present) / [früher/...] immer V (past)
Suele comer carne. / Solià comer carne.
Normalerweise ist er Fleisch. / Früher hat er immer Fleisch gegessen.
‘He eats meat.’ / ‘He used to eat meat.’

f. ‘to V (NP) one after another cumulatively’
Spn: ir V-Ger (NP)
Gmn: (NP) nacheinander / eins nach dem anderen V
(i) Las vacas se fueron muriendo aquel año.
Die Kühe sind in dem Jahr (kurz) nacheinander gestorben.
‘One after another of the cows died that year [Spn: not necessarily all].’
contrast: Las vacas se estaban muriendo aquel año.
‘The cows were (all sick and concurrently) dying that year.’
(ii) Juan fue aprendiendo las lecciones.
Johann hat die Lektionen eine nach der anderen gelernt.
‘John learned one after another of the lessons.’

(g. ‘to finally V’ (Pos) / ‘to not quite V’ (Neg)
Spn: llegar a V-Inf  ‘to finally V after all’
no llegar a V-Inf  ‘to not quite get so far as to V’
Gmn: schliesslich / dann doch V
nicht ganz / dann doch nicht V
(i) El tiempo llegó a mejorar.
Das Wetter ist schliesslich / dann doch besser geworden.
‘The weather finally did improve after all.’
(ii) La botella no llegó a caer.
‘The bottle never did quite go so far as to actually fall [though teetering].’
Die Flasche wackelte, aber fiel dann doch nicht um.
‘The bottle teetered, but didn’t quite fall.’
h. ‘to end up Ving’
Spn: acabar V-Ger [perf]  ‘to end / wind up Ving after all’
Gmn: am Schluss...dann doch V

Acabamos yendo a la fiesta.

Am Schluss sind wir dann doch zur Party gegangen.

‘We wound up going to the party after all (after wavering / deciding not to go).’

i. ‘to have been Ving (since / for...’)
Spn: llevar V-Ger  ‘to have been Ving’
Gmn: schon V

Lleva estudiando 8 horas.  /  Llevaba estudiando 8 horas cuando llegué.
Er studiert schon 8 Stunden lang.  /  Als ich kam, hatte er schon 8 Stunden studiert.

‘He’s been studying for 8 hrs. / He had been studying for 8 hrs when I arrived.’

j. ‘to be Ving’
Spn: estar V-Ger
Gmn: gerade V (non-perfect forms)

Está escribiendo una carta.  /  Estaba escribiendo una carta.
Sie schreibt gerade einen Brief.  /  Sie schrieb gerade einen Brief.

‘She is writing a letter. / She was writing a letter.’

3.2 Treatment of Aspect as Distinct from Other Verbal Categories. While the German examples in (3) are clear evidence that that language uses satellites to express aspect, for this to be a distinctive pattern one must determine that the satellite is not simply used for nearly any semantic category. On inspection, one does observe that out of some six verbal categories, aspect is the sole category that receives extensive expression in satellite form, while the other categories are mainly expressed by the main finite-inflected verb. This pattern is even more pronounced in modern spoken German, where earlier inflections, which can be regarded as a type of satellite to the verb stem, have progressively given way to the use of main verb forms. Thus, TENSE is regularly expressed by haben ‘past’ and werden ‘future’ (the present and a residue of past usage are inflectional). Non-active VOICE types are indicated by werden and kriegen. CONDITIONALITY is largely expressed by würden (though a residue is expressed by subjunctive inflections). MODALITY is mainly expressed by such modal verbs as können ‘can’, sollen ‘should’, and müssen ‘must’ (though subjunctive inflections can express some modality). And EVIDENTIALITY, or at least the distinction between deontic and epistemic senses, is largely indicated by the pattern of auxiliary forms, including the main finite-inflected one, as between Er hat es machen müssen, ‘He had to do it’, and Er muss es gemacht haben, ‘He must have done it’ (again, subjunctive inflections can indicate some evidentiality). However, though also expressed by some main verb forms, aspect is the only one of these verbal categories to receive preponderant expression by satellites, and thus to be placed syntactically in a single class with the expression of Path.
Something of the contrary picture occurs in Spanish. Although in Spanish the distinctness of aspect from the other verbal categories is less pronounced, it can still be noted that, while aspect is extensively expressed by the main verb stem and therein is in the same class with Path, several of the other verbal categories are mostly expressed by non-V-stem constituents, viz., by inflections and clitics to the main V stem. Fitting this description are tense (except for one of the two future forms, "ir a V-Inf"), conditionality, and passive voice as rendered by the reflexive pronouns.

The explanation for such differential treatment of aspect may lie in the conceptual analogy (cited earlier) that aspect is the temporal structuring of events relative to the ongoing time line and is therefore allied with path, as the spatial structuring of a progressing line of motion -- whereas a comparable conceptual analogy is not readily established for the other verbal categories.

4. **State Change as the Framing Event.** The third type of framing event we consider is an event of state change -- which is, in the case where it is conceived that a certain property is associated with a particular object or situation, an event that consists of a change in, or the unchanging continuation of, that property.

For such an association and change, one can entertain a range of conceptualizations and corresponding linguistic expressions. For example, the event could be conceived and expressed directly in terms of change or stasis in the property itself, as suggested by constructed formulations like *His (state of) health changed from well to ill* or *His (state of) health is illness*. Or, the property could be conceptualized as a figural entity with respect to the object or situation as a ground, e.g., as if the property comes to or occurs in the object or situation, as suggested by formulations like *Illness came to him* or *Illness is in him*. Or, conversely, the object or situation could be conceptualized as a figural entity with respect to the property as a ground element, e.g., as if coming to or occurring in the property, as suggested by formulations like *He sickened / became ill / went to ill health* or *He ails / is ill / is in ill health*.

Now, while all three of these conceptualization-formulation types, and perhaps still others, may occur in a language, and while no immediately evident factor accounts for any superiority of one type over the others, nevertheless the third type is, with seeming universality, the most basic and preponderant in any language. The domain schematization for state change should reflect this preferential conceptualization. Accordingly, the figural entity is the object or situation involved with properties, while the ground elements are the properties; the activating process is either the object/situation's transition among the properties, i.e., what is normally understood as change, or its staying fixed with respect to the properties, i.e., stasis; and the relating function is the direction of association that the object/situation has with respect to a selected property, what will be termed the **transition-type** -- usually one of acquiring the association, represented below as TO, but other possibilities do occur. A property that, as
here, is conceptualized as a ground element can now be called a state, a term thus reserved for that interpretation. The core schema of the state change event is generally the combination of the transition-type plus the state, and hence is the analog of the Path + Ground of a Motion event.

Thus, we find that the organization of conceptualization for linguistic expression sets state change into analogy with Motion -- in particular, change or stasis with respect to states parallels motion or stationariness with respect to objects, and state transition-type parallels Path type. This conceptual analogy motivates a syntactic and lexical analogy: to a great extent in a language, state change is expressed in the same constituent type as Path (+ Ground), and often by homophonous forms. Thus, in accordance with the general typology, the core schema of an event of state change appears in the main verb in verb-framed languages but in the satellite in satellite-framed languages, as exemplified below respectively by Spanish and by English or German.

In accordance with the customary properties of a framing event relative to a supporting event, the state change event is largely more abstract in character, often involving change purely in an individual’s cognitive state, for instance, to cite some state changes from the examples below: ‘to become awake / aware / familiar / in possession / existent / non-existent / dead’. On the other hand, the supporting event is largely concrete and physical, for instance, again from the examples below: ‘to battle / play / run / shake / jerk / rot / boil’.

In the reverse direction, the S-relation of the supporting event to the state change event can apparently exhibit much the same range of types as in the case of Motion, with Manner and Cause likewise the most prevalent types. Thus, to take some English non-agentive examples, the supporting verbs bear a Manner relation to the framing satellites in The door swung / creaked / slammed shut and He jerked / started awake, whereas it bears a Cause relation in The door blew shut. Likewise in agentive constructions, the verb-to-satellite S-relation can be one of Manner, as in I swung / slammed the door shut. and I eased him awake gently, or one of Cause, as in I kicked the door shut and I shook him awake. True, in these latter Manner cases, the Agent initiates a causal chain of events that culminates in the state-change event and, to this extent, that event is marked as being caused. However, the verb names an action that is not one of the chained causal events but rather an event accompanying the state change and qualifying it as Manner. Because of this range of S-relation types, the traditional terms "result" and "resultative" would be misnomers for the whole state change category, since, within the referential scope of a sentence, the change of state can be a result only if it is conceptually paired with a cause, an arrangement that we have just seen is only one option out of a number. While such a cause-result pairing may predominate in the usage, or in some syntactic circumstances be obligatory, it is not definitional of the entire state-change category.
4.1 Forms Suggesting Parallelism with Path + Ground. As before with
temporal contouring, the demonstration of state change can be heuristically best
begun with an example in which English can represent the core schema
sequence — here, of transition-type plus state — part-for-part with a preposition
plus noun, thus exhibiting explicitly the analogy to the common construction
type representing a Path plus Ground of Motion. Thus, as the macro-event’s
conceptual structure is schematized in (4), the core schema sequence TO
DEATH can be represented in English by the phrase to death, a phrase perhaps
to be interpreted as corresponding to the framing satellite. The Spanish counter-
part conflates the core schema together with the activating process, represented
by "MOVE" or agentive "MOVE", with the combination mapping onto the
framing verb — an option, as it happens, also available in English with the verbs
die / kill.

(4) a. non-agentive
[he "MOVED" TO DEATH] AS-A-RESULT-OF [he choked on a bone]
Eng: He choked to death on a bone.
Spn: Murid atragantado por un hueso / porque se atragantó con un hueso.
"He died choked by a bone / because he choked himself with a bone."

b. agentive
[I "MOVED" him TO DEATH] BY [I burned him]
Eng: I burned him to death.
Spn: Lo maté con fuego / quemándolo.
"I killed him with fire / [by] burning him."

The core schema of this illustration, TO DEATH, serves triple duty in that
it is further found in German to map as a combination onto a monomorphemic
framing satellite, the inseparable verb prefix er₁-, as seen in (5). A satellite of
this semantic sort thus parallels a Path+Ground-expressing satellite like English
home, but while such satellites are unusual for Motion in English, they are the
norm for state change in English-type languages.

(5) Gmn: er₁-V NP-Acc 'V NP to death' / 'kill NP by Ving NP'

(er-) drücken / schlagen / würgen / stechen / schiessen
'to squeeze / beat / choke / stab / shoot (to death)'

For one further step in this introductory series, to express the meaning of
another German satellite, er₂- 'into one’s possession', English lacks either a
satellite or a "P + NP" construction and, and instead must express the meaning
in a verb such as get / obtain / win, in just the way typical of a verb-framed
language. However, for heuristic purposes, the "P + NP" phrase into [subject's]
possession, though not used thus in English, does sufficiently follow extant
patterns as to be readily pressed into service to render the German construction, as seen in (6). Not all of the state change concepts treated below will be as amenable in English to this type of suggestive paraphrasing, so that the macro-event representations for such concepts (which here, after all, are indicated with English words) will seem more awkward, but they can still serve as schematics showing the interrelations of the component meanings.

(6) Gm: er²-V NP-Acc (Refl-Dat) "V NP into one's possession"/"obtain NP by Ving’

a. [the army "MOVED" the peninsula INTO ITS POSSESSION] BY [it battled]
   Die Armee hat (sich) die Halbinsel erkämpft.
   'The army gained the peninsula by battling.'
   as if: 'The army battled the peninsula into its possession.'

b. Die Arbeiter haben sich eine Lohnerhöhung erstreikt.
   'The workers won a pay raise by striking.'
   as if: 'The workers struck a pay raise into their possession.'

c. Wir haben öl erbohrt.
   'We obtained oil by drilling.'
   as if: 'We drilled oil into our possession.'

Note that, in its different usages above, the German prefixal satellite er- has been given different subscripts to indicate that it is here regarded as a polysemous morpheme with distinct pockets of meaning, not a morpheme readily fitted with a single abstractionist gloss like 'completive', as is often attempted. This distinction is based on such evidence as the fact that erdrücken does not mean 'to squeeze to completion' but rather 'to squeeze to death' -- that is, the German notion of 'squeezing' does not have an intrinsic or standardly associated end-point which a generic er- simply invokes.

4.2 Change in State of Existence. Having introduced the state change type with examples involving death and possession, we can continue considering the semantic range of state change with an exploration of one domain: change with respect to state of existence. We first consider the transition from an existent to a non-existent state, i.e., from presence to absence. This conceptual type is generically expressed in English by the phrases go/put out of existence, which directly represent part for part the final three components of the framing event. However, some more particular senses are expressed conflatedly. For a first case that can function as a discrete transition type, the concept of a flame or light becoming extinguished can be expressed in English by a monomorphemic satellite out, while in Spanish, as per the usual contrast, it is expressed in the verb, as seen in (7).
(7) V out (NP) ‘V (NP) to extinguishment’ / ‘extinguish (NP) by Ving’

intrans:
[the candle "MOVED" TO EXTINGUISHMENT] DURING WHICH [it flickered / ...]
   The candle flickered / sputtered out.
[the candle "MOVED" TO EXTINGUISHMENT] AS-A-RESULT-OF [... blew on it]
   The candle blew out.

trans:
[I "MOVED" the candle TO EXTINGUISHMENT] BY [I blew on / ... it]
   I blew / waved / pinched the candle out.
   Spn: Apagué la vela soplándola / de un soplido.
   "I extinguished the candle [by] blowing-on it / with a blow"

For a case with a "bounded gradient" transition type -- i.e., where the
change is a progressive transition through a gradient state that terminates with a
final state -- the concept of an object’s gradual diminishment until final disapp-
pearance, through some usually organic process, is expressed in English by the
satellite away and, again, in Spanish by a main verb, as seen in (8). One test
for the transition-types just adduced is a form’s behavior with different types of
temporal expressions. Thus, a discrete transition type is consonant with a punctu-
tial expression, as with The candle blew out at exactly midnight, as against
*The meat rotted away at exactly midnight., whereas a bounded gradient transi-
tion type is consonant with an expression of bounded temporal extent, as in The
meat rotted away in five days.

(8) V away ‘V to gradual disappearance’ / ‘gradually disappear as a result of Ving’

[the meat "MOVED" GRADUALLY TO DISAPPEARANCE]
   AS-A-RESULT-OF [it rotted]
   The meat rotted away.
      also: The ice melted away. / The hinge rusted away. /
         The image faded away. / The jacket’s elbows have worn away.
   Eng: The leaves withered away.
   Spn: Las hojas se desintegraron al secarse.
   "The leaves disintegrated by withering."

A further case of the bounded gradient transition-type is expressed by the
English satellite up in examples like those of (9). Though needing further eluci-
dation, the semantic difference between away and up at least involves a conceptu-
tal categorization of rate and time scale, with away as slow and lengthy and up
as quick and brief. In addition, these forms with up seem to have a particularly
aspectual character, and thus point to the likelihood of a conceptual continuum
between aspect and state change as opposed to any sharp category division.
Accordingly, as noted in the previous section on temporal contouring, much that
is traditionally treated as aspect also involves state change, so that a number of the examples appearing there could equally have fit in the present section, and it can be further noted that all particular state changes have a specific aspectual contour (or a range of possible contours).

(9) V up ‘V to consumedness’ / ‘become consumed in Ving’
    V up NP ‘V NP to consumedness’ / ‘consume NP by Ving it’

a. [the log "MOVED" TO CONSUMEDNESS in 1 hour]
   AS-A-RESULT-OF [it was burning]
   The log burned up in 1 hour.
   contrast burn alone: The log burned (for 30 mins. before going out by itself).

b. [I "MOVED" the popcorn TO CONSUMEDNESS in 10 mins.] BY [I was eating it]
   I ate up the popcorn in 10 mins.
   contrast eat alone: I ate the popcorn (for 5 mins. before I stopped myself).

The German prefixal satellite ver- also expresses a gradient progression to a final state, indicating that an Agent has exhausted the entirety of some object in acting on it, as illustrated in (10). Here, however, the object itself need not physically disappear and may merely become altered, but what does disappear is the supply of the object in its original condition available for the Agent’s use in acting upon it. Thus, here, the state change from presence to absence pertains not to a first-order object, which instead may continue in existence, but rather to an abstract second-order meta-object, the supply.

(10) Gmn: ver-V NP-Acc
    ‘use up / exhaust NP by Ving (with) it’ / "V NP to exhaustion"

a. [I "MOVED" all the ink TO EXHAUSTION] BY [I wrote with it]
   Ich habe die ganze Tinte verschrieben.
   "I've written all the ink to exhaustion."
   'I've used up all the ink in writing.'

b. Ich habe alle Wolle versponnen. 'I've used up all the wool in spinning.'

c. Ich habe meine ganze Munition verschossen.
   'I've exhausted my ammunition in shooting.'

Remaining in the area of change with respect to state of existence, we now turn to the reverse of the preceding direction of change, hence to the transition from a non-existent to an existent state, i.e., from absence to presence. Again, there are English expressions, *come / bring into existence*, that directly map the final three components of the generic framing event part-for-part onto syntactic and lexical structure. In addition, the English satellite *up* expresses the same generic concept, as illustrated in (11), where the core schema INTO
EXISTENCE as a combination maps onto the single morpheme of the satellite. This satellite covers either a discrete or a bounded-gradient interpretation for the transition-type, according to the context, as demonstrated by its equal compatibility with either at or in type temporal phrases. In its agentive use, the framing event type under discussion -- state change from non-existence to existence -- amounts to the traditional notion of "effected object", as against "affected object", so that the English satellite up as used here and its counterparts in other languages can be taken as markers of an effected object construction.

(11) V up NP ‘V NP into existence’ / ‘make/create NP by Ving’

a. [I "MOVED" INTO EXISTENCE three copies of his original letter]
BY [I xeroxed it]
I xeroxed up (*xeroxed) three copies of his original letter.
contrast xerox alone: I xeroxed (*up) his original letter.
b. I boiled up (*boiled) some coffee for breakfast at our campsite.
contrast boil alone (any acceptable use of up has a different sense):
I boiled (*up) last night’s coffee for breakfast / some water at our campsite.
c. [I "MOVED" INTO EXISTENCE a plan] BY [I thought (about the issues)]
I thought up (*thought) a plan.
contrast think alone: I thought *up / about the issues.

It was seen above that the German satellite ver- expresses the gradual disappearance of an abstract second-order meta-object, viz., a supply. Comparably in the reverse direction, another English up satellite expresses the gradual appearance of an abstract, second-order meta-object, an ‘accumulation’, as illustrated in (12). Here, the verb-specified action affects but does not create the first-order objects named (below: money, property), but the repetition of this action does create the accumulation per se as a higher-level Gestalt entity.

(12) V up NP ‘progressively accumulate / amass NP by Ving’

a. [I "MOVED" INTO AN ACCUMULATION $5,000 in 5 years] BY [I saved it]
I saved up $5,000 in 5 years.
contrast save alone: I saved (*up) (the/my) $1,000 for 2 years.
b. Jane has bought up beach-front property in the county.
--i.e., has progressively amassed a good deal of property over time
contrast: Jane has bought beach-front property in the country.
--possibly just a little on one occasion

Two Russian satellites contrast nicely as to the level of the object in reference. The path prefix "s-[V] [NP-pl]-Acc" merely specifies paths of motion that yield a spatial juxtaposition of plural objects, thus corresponding well to English
together. But the state-change prefix "na-[V] [NP-pl]-GEN" indicates that such a juxtaposition constitutes a higher-level Gestalt, an accumulation, as in (13).

(13) Rus: na-V NP-Gen ‘create an accumulation of NP by Ving NP’

Ona nagrebla orexov v fartuk. "She accumulation-scraped nuts(Gen) into apron."
‘By scraping them together into her apron, she accumulated (a heap/pile of) nuts’.
contrast: Ona sgrebla orexi v fartuk. "She together-scraped nuts(Acc) into apron."
‘She scraped together the nuts into her apron’.

4.3 Change in Condition. As the introductory examples showed, the state change type encompasses more than just state of existence, and, for heuristic purposes, we now represent a range of this "change in condition" with examples both of physical and cognitive change and both in the Patient and in the Agent. For a physical case, the concept of changing an object from an intact condition to what can be conceptually categorized as a non-intact condition can be expressed in English again by an up satellite, in German more specifically and more productively by the satellite kaputt-, and in Spanish, as usual, with a main verb, as seen in (14).

(14) Eng: V up NP / Gmn: kaputt-V NP-Acc ‘make NP non-intact by Ving it’

[the dog "MOVED" TO NON-INTACTNESS the shoe in 30 mins.]
    BY [he chewed on it]
    The dog chewed the shoe up in 30 mins.
contrast chew without up: The dog chewed on the shoe (for 15 mins.).
Gmn: Der Hund hat den Schuh in 30 Minuten kaputtgebissen.
    "The dog bit the shoe up in 30 mins."
contrast: Der Hund hat 15 Minuten an dem Schue gekaut.
    "The dog chewed on the shoe [for] 15 mins."
Spn: El perro destrozó el zapato a mordiscos / mordiéndolo en 30 minitos.
    "The dog destroyed the shoe with bites / [by] biting it in 30 mins."
contrast: El perro mordisqueó el zapato (durante 15 minutos).
    "The dog chewed-on the shoe (for 15 mins.)."

A number of state change satellites in other languages have no counterpart in English, which must resort to framing verb constructions to render them, and the concepts such satellites express can range quite broadly, more so than English speakers might expect. An example with range of application from the physical to the cognitive is the German satellite construction "ein-V NP/Refl-Acc", where the satellite’s meaning can be characterized in broad strokes as ‘to readiness’ and the construction’s meaning more finely as ‘to warm (NP) up for Ving by (practicing at) Ving’, as in die Maschine einfahren, ‘to warm up the machine for operating it’ or in sich ein-laufen / -spielen / -singen, ‘by practicing
at the activity itself, to warm up for running / playing / singing'.

Another German example, possibly in a polysemous chain with the preceding example but semantically distinct enough, is an ein- satellite with a solely cognitive meaning that can be characterized broadly as 'to familiarity' and more finely as in (15).

(15) Gmn:  ein-V Refl-Acc in NP-Acc  'to have gradually managed to become
easefully familiar with all the ins and outs of NP in Ving (in/with) NP'

a. Ich habe mich in das Buch eingele sen.
   "I have read myself into the book."
   'I've gotten familiarized enough with the book
   that I can keep all the characters and plot involvements straight.'

b. Der Schauspieler hat sich in seine Rolle eingespielt.
   "The actor has played himself into his role."
   'The actor has come to know his part with ease in the course of acting in it.'

c. Ich habe mich in meinen Beruf eingearbeitet.
   "I have worked myself into my job."
   'I know the ropes in my work now.'

In these preceding transitive examples, including the reflexive ones, what has manifested the change in condition was the Patient expressed in the direct object NP. But in another transitive example that does not fit this mapping, and so calls for further investigation, the Agent or Experiencer expressed by the subject NP is the entity that manifests the change in condition. In particular, with the German satellite illustrated in (16), the subject Experiencer undergoes a cognitive change, one that can be characterized in broad terms as 'to awareness' and more finely as indicated below.

(16) Gmn:  heraus-V NP-Acc  [V: sensory verb]
   'detect and sensorily single out NP among other comparable NPs
   via the sensory modality of Ving'  

Sie hat ihr Kind herausgehört.
   "She has heard out her child."
   'She could distinguish her child's voice from among the other children talking.'

5. Action Correlating as the Framing Event. The fourth type of framing event has not to my knowledge been previously recognized and is part of a much broader linguistic phenomenon -- which I propose to call coactivity -- that has also received scant attention as a consolidated topic. Some agency, i.e., an entity executing a certain activity, must also have an object NP that refers to a second agency, one whose activity is appropriate to the first activity -- typically,
either comparable to it or complementary to it. Prototypically across languages, such a coactive object NP is required by symmetric verbs, comitatives, datives, and certain further syntactic categories. Thus, I met John / *the corpse requires that John also engage in the action of meeting me; I ate with John / *the corpse requires that John also engage in eating; I threw the ball to John / *the corpse or I threw John / *the corpse the ball require that John engage in the action of trying to catch the ball, as an action complementary to my throwing it; and I ran after John / *the tree requires that John also engage in swift forward motion.

In the fourth type of framing event, which will be termed action correlating, an intentional Agent effects or maintains a particular correlation between an action performed by himself and an action performed by another Agency which can be either animate or inanimate. The framing event consists of the establishment of this correlation per se. The types of such correlation that will be treated below are ‘concert’, ‘accompaniment’, ‘imitation’, ‘surpassment’, and ‘demonstration’. The supporting event consists of the specific action performed by the Agent. Except for the ‘demonstration’ type, this action is either the same as the action performed by the Agency or is in the same category, as understood according to pragmatic norms that will need investigation.

Apparently here, in the way that conceptual structure is organized for linguistic expression, such action correlating is analogized to Motion in that the correlation of one action with respect to another parallels the path of one object with respect to another. In particular, in the conceptual structuring of the framing event, as schematized in (17a), the Agent places his own action as figural entity -- represented as Action for the generic form -- in correlation with an Agency’s same-category action as ground element -- generically represented as Action. This structure is thus comparable to that of agentive motion of the sort: Agent MOVE Figure Path Ground. The core schema here is then a straight Path-analog, the In-Correlation-With component. The remainder of the macro-event, also schematized in (17a), consists of the supporting event, which is the specific action that is performed by the Agent, here represented as [Agent PERFORM], and the constitutive S-relation that this supporting event bears to the framing event. This S-relation is so termed because the specific activity of the supporting event constitutes the action that the Agent sets in correlation with the Agency’s action, and it will also constitute the Agency’s action in the case where that happens to be identical to the Agent’s action rather than just of the same category.

While the macro-event structure as schematized in (17a) seems more closely to represent the interrelationships among the conceptual components, a particular adaptation of this structure, as schematized in (17b), seems to be closer to the patterns in which this semantic type is mapped onto occurrent syntactic structures, at least in the languages considered here. Thus, on the basis of (17b) and in accordance with the usual typology, in verb-framed languages the core schema maps onto a satellite (plus adposition) and the supporting event
maps into the main verb, while in verb-framed languages the combination of the
ACT component and the core schema maps onto the main verb (plus adposition)
and the supporting event maps into an adjunct.

(17)  a. [Agent PUT Agent’s Action In-Correlation-With Agency’s Action]
       CONSTITUTED-BY [Agent PERFORM]

       b. [Agent ACT In-Correlation-With Agency]
       CONSTITUTED-BY [Agent PERFORM]

With respect to the framing event’s role in the present type, it clearly pro-
vides the overarching framework within which two actions are brought into
correlation with each other. In addition, the general pattern is maintained in that
the framing event is relatively abstract in character while the supporting event is
typically concrete. Thus, if an observer were present in the situation referred to
by a macro-event of action correlating, that observer would directly perceive the
specific supporting event activity that is performed by the Agent and would per-
ceive the same or something similar performed by the Agency -- e.g., as in the
illustrations below, these actions could be playing, singing, drinking, etc. But
the observer could generally not perceive, but would rather need to infer or oth-
erwise know the intended relation of the one action to the other, e.g., that the
Agent performs his action so that it will be in concert with that of the Agency,
or in accompaniment to it, or in imitation of it, etc.

We now consider five different cases of action correlating.

Agency’s Action is Same(-Category) as Agent’s Action. In their semantic dis-
 distinctions, the first three cases of action correlating here can be taken to form a
series based on an increasing conceptual distance in the correlation of the
Agent’s action with that of the Agency. With English and German used as the
languages of illustration, both are needed to represent the series in terms of
expression by satellites, since only English has a satellite proper for the first
case while only German has one for the third.

The conceptual difference between the first two cases is instructive. In the
first case, expressed in English by together (with)\(^7\), as illustrated in (18), the
Agent acts in concert with the Agency -- i.e., both the Agent’s action and the
Agency’s action are set in conception as equipotent components of a joint unity
perhaps with each as essential for the existence of the whole. In the second
case, expressed in English by along (with and in German by mit- (mit-Dat), as
illustrated in (19), the Agent acts in accompaniment or as an addition or adjunct
to the Agency -- i.e., the Agency’s action, which functions as a ground element
and hence as a conceptual reference point, is treated as independent or basic and
as the essential or definitional activity of the situation, whereas the Agent’s
action as figural entity is treated as an ancillary or incidental aspect of the total
situation. (This second case is one manifestation of an extensive semantic sys-
tem in language that distinguishes ‘main’ from ‘ancillary’.) To contextualize
this conceptual difference for the situation of the illustrations, assume that "I" and "he" are each playing a piano on the same concert stage. Then, in the first case, he and I might be dual pianists, whereas in the second case, he might be a featured soloist whom I have joined to assist. Comparably, I jog together with him suggests that we schedule and execute our activity jointly and might not engage in it singly, whereas I jog along with him suggests that he has his own regular routine of jogging independently, whether or not I am present, but where I sometimes accompany him as an addition. Of note here is the fact that for both cases the referent situation can be indistinguishably the same with respect to its physical constitution. That is, the first two action correlations, 'concert' and 'accompaniment', function as conceptual structures overlaid or imposed on a substrate. They thereby constitute excellent examples for cognitive linguistics of conceptual imputation, a mind-to-world direction of fit, as opposed to the often-held notion that only properties in objects "out there" can be reflected in language in a truth-value oriented semantics or by a world-to-mind direction of fit.

The original stipulation that the second participant in an action correlation -- here distinctively termed the "Agency" -- can be either animate or inanimate was made to accommodate the observed linguistic patterns. For instance, in the examples for the first four cases of action correlating below, all three illustrative languages allow replacement of the "him" or its counterpart by "phonograph record" or its counterpart, as in the English I played along with the phonograph record. Comparably, the stipulation that the Agency's activity need only be in the same category as that of the Agent was made to accommodate the English and German satellite usage. For instance, in Mary sang along with John, John could be playing an instrument while Mary sings, and rendering a different harmonic part than she. Similarly, the German Ich trinke mit "I (will) drink along", can refer to my drinking but not eating after joining someone who is eating but not drinking.

In accordance with the general typology, the Spanish forms in the examples below express in the main verb the same concept of action correlation for which English and German mostly use satellites, though again, English has verbs borrowed from Romance, e.g., accompany, join, imitate, copy) with the same mapping pattern as their source language. As it happens though, the same-category affordance permitted in German and English does not hold in Spanish. For, in expressing the supporting event in an adjunct, Spanish generally must employ different constructions that distinguish between identical actions and same-category but different actions on the part of the Agent and the Agency.

(18) Eng: V together with NP 'act in concert with NP at Ving'

[I ACTed IN-CONCERT-WITH him] CONSTITUTED-BY [I played the melody]
I played the melody together with him.
(19) Eng: V along (with NP) / Gmn: mit-V (mit NP-Dat)
'act in accompaniment of / as an adjunct to // accompany / join (in with) NP at Ving'

[I ACTed IN-ACCOMPANIMENT-OF him]
CONSTITUTED-BY [I played the melody]
Eng: I played the melody along with him.
Gmn: Ich habe mit ihm die Melodie mitgespielt.
Spn: Yo lo acompañé cuando tocamos la melodia.
"I accompanied him when we played the melody." (both he and I played)
Yo lo acompañé tocando la melodía.
"I accompanied him [by] playing the melody." (only I played)

The third in the series of action correlations is the case where the Agent directs his own activity so as to be an imitation or copy of the Agency’s activity, as illustrated in (20). Here again, the Agency’s activity, as ground element, is the reference point in relation to which the Agent endeavors to shape his own activity as a figural entity. In particular, from observing the Agency’s activity, the Agent endeavors to make his own activity similar or equivalent to the whole of or to selected structural aspects of the Agency’s activity. Whereas in the first two cases the Agent’s activity was concurrent with that of the Agency, here it follows that of the Agency, with the German nach- satellite prototypically suggesting that this delay is only a brief part-for-part lagging behind, though the interpretation is also available that the Agent’s performance wholly follows the ending of the Agency’s performance. Again, the Agency can be an inanimate device like a phonograph, and the Agency’s activity can be identical to or only in the same category with the Agent’s activity, so that the German sentence in (20) could equally well refer to a recorded vocalist that I imitate on an instrument. And, as before, Spanish employs its main verb to render the action correlation itself, while the adjunct specifies the activities and also distinguishes whether they are the same or different within the same category.

(20) Gmn: nach-V (NP-Dat) ‘V in imitation of NP’ / ‘imitate / copy NP at Ving’

[I ACTed IN-IMIATION-OF him] CONSTITUTED-BY [I played the melody]
Gmn: Ich habe ihm die Melodie nachgespielt.
Eng: I played the melody in imitation of him.
Spn: Yo lo seguía cuando tocamos la melodía.
"I followed him when we played the melody." (both he and I played)
Yo lo seguía tocando la melodía.
"I followed him [by] playing the melody." (only I played)

In the fourth case of action correlating (illustrated in (21) with the English prefixal satellite *out-*), the Agent either marshals his activity to, or his activity simply does, surpass the Agency’s activity, which is again used as a reference
point. In the specific context of a competition, the Agent thus ‘beats’ the Agency. As before, the Agency can be inanimate, as in I outplayed the player piano, but now the Agency’s activity is limited to being the same as that of the Agent, not just to being of the same category, so that there is no *I outplayed the singer in the sense that I played better than the singer sang. Spanish again uses its main verb to convey the correlation, but this time the gerundive adjunct can be used with the identical-activity interpretation, though apparently a different-activity interpretation is also possible.

(21) Eng: out-V NP ‘surpass / best / beat NP at Ving’

[I ACTed IN-SURPASSMENT-OF him]  
CONSTITUTED-BY [I played (the melody)]

Eng: I outplayed him. (cf: I outran / outcooked him.)

Spn: Yo lo superé tocando la melodia. "I surpassed him playing the melody."

**Agency’s Action is Fixed and Distinct from Agent’s Action.** In a fifth case of action correlating, expressed by the German satellite vor- and illustrated in (22), the Agent executes an activity so that it will function as a demonstration to an Agency that, in turn, will observe the Agent’s activity. In the concept of ‘demonstration’ present here, the Agent has the knowledge and capacity to perform a certain activity which the Agency lacks. The Agent executes this activity so that the Agency can register it either as information about the Agent or as a model for learning to perform the same activity, and the whole situation can have the metaphoric sense of a transfer from the Agent to the Agency. This ‘demonstration’ case differs from the preceding cases in that the Agency’s own activity is fixed, in particular as an activity of observation, and as such it regularly diverges from the Agent’s activity -- a difference that merits a revised schematization of the original macro-event, shown first in (17). Further, this case stretches the preceding notion of correlating, which had been based on the interrelating of comparable activities, to a notion of the coordinating of complementary activities: specifically, those of demonstration and of observation. Still, this case -- in common with the others -- does relate the activity of one entity to that of another, and the mapping patterns are wholly comparable, with German expressing the relationship in the satellite, and Spanish -- this time together with English -- expressing it in the main verb.
(22) Gmn: vor-V NP-Dat ‘demonstrate to NP one’s Ving’

[Agent PUT Agent’s Action IN-DEMONSTRATION-TO Agency’s OBSERVATION] CONSTITUTED-BY [Agent PERFORM]
[I ACTeled IN-DEMONSTRATION-TO him] CONSTITUTED-BY [I played the melody]
Gmn: Ich habe ihm die Melodie vorgespielt.
"I played the melody in demonstration to him."
Eng: I showed him how I / how to play the melody.
Spn: Yo le mostré como toco / tocar la melodia. (same as English)

6. Realization as the Framing Event. The fifth type of framing event is an event of realization, which itself is an encompassive category for a hierarchical pair of related types that will be termed fulfillment and confirmation.

6.1 Incremental Semantic Series Containing Realization Types. Since the semantic properties of these types are not very familiar, it may be best to begin with a demonstration, one which will involve an incremental series of four verbal patterns into which the two realization types fit, as illustrated in (23) in the agentive for a satellite-framed language, English.

(23) a. V: action; Sat: state-change resulting from that action
   e.g.: kick ‘propel foot into impact with’ --vs.: kick flat
   I kicked the hubcap. / I kicked the hubcap flat.

   b. V: action + intention; Sat: fulfillment of that intention
   e.g.: hunt ‘go about looking with the intention of thereby finding and capturing’
       --vs.: hunt down
       The police hunted the fugitive for/*in 3 days (but they didn’t catch him).
       The police hunted the fugitive down in/*for 5 days (*but they didn’t catch him).

   c. V: action + intention + implicature of fulfillment of the intention
      Sat: confirmation of that implicature
      e.g.: wash ‘immerse and agitate with the intention of cleansing thereby
           + implicature that cleansing occurred’ --vs: wash clean
           I washed the shirt (but it came out dirty).
           I washed the shirt clean (*but it came out dirty).

   d. V: action+intention+fulfillment of that intention; Sat: not relevant/usable
      e.g.: drown ‘submerge with intention of killing thereby + succeeding therein’
           --no: *drown dead
           I drowned him (*but he wasn’t dead). / *I drowned him dead / to death.
6.1.1 Action. At the semantically simpler end of the series, as in (23a), the verb refers to a situation in which an Agent intends and executes what can be taken as a simplex action. The first relevant characteristic of this pattern is that the Agent's scope of intention extends only over the action itself, and no further (i.e., as far as the meaning of the verb per se is concerned). The second relevant characteristic is that the executed action can be conceptualized as a single qualitatively unitary action, as assessed at a certain larger scope of granularity. With this verbal pattern, the addition of a satellite adds a semantic increment that is wholly extrinsic to the referential content of the verb. For example, adding flat to kick, as in (23a), simply adds the meanings of the satellite and of the satellite construction to the meaning of the verb, so that the same act of kicking is now additionally understood to cause the named state change.

6.1.2 Action + Intention. The next verbal pattern is the fulfillment type of realization. Here, as before, the verb refers to an Agent intending and executing a particular action, the whole of which takes place. But here, in addition, the Agent's scope of intention extends beyond the execution of this action alone. Specifically, the Agent further intends that the action lead to a particular result, one that, within the referential scope of the verb, does not come about and whose eventual success or failure is left moot. With this verbal pattern, the addition of a satellite indicates that this intention to bring about a particular goal has in fact been fulfilled and the goal achieved. Here, the meaning of the satellite's addition is not independent of the meaning of the verb, but is sensitive to the internal structure of that semantic complex and complements it.

Thus, transitive hunt refers to going about looking, inquiring, tracking, etc. with the intention that this activity will lead to finding and capturing a particular animate entity and this verb, when used without a satellite, has unbounded aspect (cf. Talmy 1988a) and is moot regarding the outcome. The addition of the satellite down indicates that the intention was fulfilled, i.e., that the finding and capturing actually took place, where this combined event complex now has bounded aspect.

The fulfillment sense of this type of satellite construction can be regarded as a special kind of state change, one pertaining to ontology. The ontological state of the intended result that is expressed by the verb is originally potential, but the satellite indicates the change of this state to actual. Thus, when fulfillment is regarded as a kind of state change, one in ontology, it could be equivalently termed actualization. In effect, the verb by itself can be considered to express the schema for a desired result, while the satellite indicates that this schema has been "filled in", or actualized.

6.1.3 Action + Intention + Implicature of Fulfillment of Intention. In the third verbal pattern, the "confirmation" type, as in (23c), the verb expresses the same two components as in the preceding type, i.e., an Agent's intended and executed action plus his intention that this action lead to a certain desired result, but, in addition, the verb conveys a particular implicature: that the intention to
bring about the result has been fulfilled. The evidence for the presence of such an implicature is simply that the normal reading of a sentence containing this type of verb, even unaccompanied by a satellite, is that the desired goal is achieved. However, this component of the verb’s meaning is merely an implicature, since this reading is defeasible by a disclaiming phrase. With the addition of a satellite, though, the achievement of the intended result is now certain and not merely a defeasible implicature, so that any disclaiming phrase is now unacceptable. That is, the addition of the satellite confirms what otherwise is only implicated, hence the term for this type of realization.

Thus, the (23c) sentence I washed the shirt not only indicates that I immersed and agitated the shirt in liquid with the intention of getting it clean as a result, but, with nothing further added, also implicates that the shirt in fact got clean -- an implicature, though, that can be defeated by adding but it came out dirty. However, the addition of the satellite clean certifies that the verb’s original implicature has now extended beyond that status to become a claimed fact.

While English is not rich in the confirmation type of verbal pattern, another example of it may be in the verb call, which indicates dialing a number with the intention of thereby telephonically connecting with a party, together with the implicature that this connection has occurred. Thus, the sentence I called her by itself standardly implicates my reaching her, but this implicature is readily defeated, as in I called her three times but there was no answer. And, for some speakers at least, the addition of the satellite up confirms the connection and thus precludes a disclaimer: I called her up (*but there was no answer). But while English has only scattered examples of it, this verbal pattern is a major type in other languages, e.g., Mandarin, as illustrated below.

In both English and Mandarin, the satellites expressing realization, either fulfillment or confirmation, are of two kinds. The satellite can explicitly name the verb’s intended result -- as clean does relative to wash -- or the satellite can have a meaning not related (unless metaphorically) to the verb’s intended result, as is the case with down relative to hunt and up relative to call. In the former case, the satellite indicates fulfillment or confirmation virtually by making a separate assertion of the concept at issue; whereas, in the latter case, the satellite acts as an abstract marker of the realization factor per se, and in this way is cleaner evidence of realization as a conceptual category in its own right.

As seen earlier for the fulfillment case, the meaning of the confirmation satellite is -- especially for the second kind of satellite -- not independent of the verb’s meaning, but is sensitive to its internal semantic structure and complements it. In this case, it does so by addressing the verb’s incorporated implicature and confirming it, or in effect, upgrading it to the lexical equivalent of an assertion.

And, as before, this confirmation sense of the confirmation type of satellite construction can be regarded as a special kind of state change, one pertaining this time not to ontology but to epistemology. What is here operative at root is
the epistemic state of the speaker -- and the corresponding epistemic state that the speaker aims to induce in the addressee -- with respect to the 'intended result' component of the verb's meaning. With the satellite absent, the speaker is **presumptive** of the occurrence of the intended result; whereas, with the satellite present, the speaker is **certain** of the occurrence of the intended result. However, by a process that can be termed **objectivization**, these originally epistemic states of the speaker can be converted into so-conceived objective properties of the 'intended result' component itself. Thus, with the satellite absent, the counterpart "objective" state of this component is that it is **apparent**, while with the satellite present, the counterpart "objective" state is that it is **definite**.

To expand on the notion of objectivization: it is a major process found in the conceptual organization of language whereby a sentient being’s subjective cognitive state regarding some external entity is projected onto that entity in a counterpart form that is then conceived as an objective property of that entity itself. A ready example of this process is seen in a formulation like **The cliff is beautiful**, which seems to assert that the cliff has an objective property of 'beauty', in the same way that **The cliff is white** predicates an objective whiteness of the cliff. It is alternate constructions like **The cliff is beautiful to me** or **I find the cliff beautiful** that directly represent the non-objectivized subjective evaluation or affect of an observing experiencer.

**6.1.4 Action + Intention + Fulfillment of Intention.** In the fourth verbal pattern of the incremental series, as in (23d), the verb expresses the same two factors as in the second and third types -- i.e., an Agent's intended and executed simplex action plus his intention that this action lead to a certain desired result; however, in addition, the verb indicates neither a moot outcome nor simply an implicature of the fulfillment of the further intention, but rather the actual fulfillment of that intention. A verb of this type cannot add a satellite sensitive to and complementing the verb’s internal semantic structure -- specifically to indicate the realization of unrealized aspects, since all the conceptual elements referred to by the verb are in fact realized. English, in fact, tends to disfavor even a semantically pleonastic satellite with such a verb. Thus, English **drown** indicates that an Agent intentionally executes the action of submerging an animate entity in liquid, that the Agent further intends that this action will lead to the death of the animate entity, and that this death in fact takes place. This verb, further, does not allow the addition of what would be a redundant satellite constituent such as **dead** or **to death**, as in **I drowned him** *dead / to death*.

Characterized in this way, therefore, the referent of a verb of the fourth pattern is understood as semantically complex, consisting of two qualitatively distinct sub-events, one that is earlier than the other and intended to cause it. However, it is not clear that this putative fourth-pattern verb can be systematically distinguished from the putative first-pattern verb, either by formal syntactic criteria or referentially. It may be that the putative first and fourth verbal patterns really comprise only a single referential type on which can be imposed either of
two conceptual structures with different granularities. For example, the referent of kick, earlier described as a unitary simplex action of the first pattern, could, under a finer-grained conceptualization, be alternatively construed as a fourth-pattern actonal complex in this way: an Agent intentionally executes the action of thrusting his foot forth, he further intends that this action lead to an impact of the foot with a specific object, and this impact takes place (cf. the comparable Mandarin analysis below). In the other direction, the referent of drown could alternatively be construed, under a more coarse-grained conceptualization, as a unitary Gestalt action.

6.2 Cline in Strength of Implicature. The implicature associated with the third type of verbal pattern, the wash type, apparently behaves not as a discrete factor that is either present or absent, but as on a cline with different degrees of strength, possibly in part correlating with different strengths of the Agent's intention for a further result. Thus, in (24), the first three verbs for some speakers show increasing degrees of implicature of the fulfillment of an intention to kill, while the fourth verb, included as a reference point, no longer implicates but asserts the killing.

(24) The stranger (a) choked / (b) stabbed / (c) strangled / (d) drowned him.

*Choke* appears to range from having no implicature of killing for some speakers -- referring solely to the action of squeezing in upon the neck -- to having a slight implicature of killing for other speakers. For the second group, the example with *choke* in (24) can be fairly felicitously followed by a denial constituent like ...*but he was still alive when the police arrived.*

*Stab* seems to implicate killing more strongly, to be felt to do so by more speakers, and to combine well with the same denial clause.

For some speakers, *strangle* entails killing as fully as does *drown*, and if these speakers also sense no implicature of killing in either *choke* or *stab*, then the whole series in (24) cannot serve for them as a demonstration of an implicational cline. However, other speakers do find in *strangle* a slight opening for the possibility of unrealized killing, and can follow the sentence with the denial clause: *The stranger strangled him, but he was still alive when the police arrived* -- especially if these speakers are asked to compare this sentence with one containing *drown* instead, which for them clearly precludes denial. Such speakers, thus, have in *strangle* an excellent example of very strong implicature that is nonetheless only an implicature and not determinate.

As represented in (25), the increasing degree of implicature of fulfillment across the four example verbs tends to correlate with the verbs' decreasing ability to take a satellite that confirms the fulfillment, perhaps because such confirmation would be increasingly redundant.

6.3 Lexicalized Implicature. The implicature of the third type of verbal pattern, the *wash* type, represents a semantic-syntactic phenomenon that, to be understood adequately, must be narrowed in on through a series of contrasts with related but distinct phenomena. To take *wash* through this progression of contrasts, we first note that a part of the meaning of *wash* is the Agent’s intention to make the Patient clean, in contrast with the otherwise comparable meaning of *soak*, which lacks such a notion of intention. Evidence for this is the fact that *soak* but not *wash* can occur felicitously in reference to a situation that precludes cleansing, as in: *I soaked / ??washed the shirt in dirty ink*.

Second, in addition to an Agent’s *intention* to make clean, the use of *wash* as in *I washed the shirt* implicates that the Patient *becomes* clean, even without any explicit mention of cleanliness — as contrasted, say, with the use of *soak* in *I soaked the shirt*, whose use makes no such suggestion.

Third, the notion of the Patient’s becoming clean is only an implicature and not an essential part of the meaning of *wash*, since that notion can be denied, as in *I washed the shirt, but it came out dirty*. By contrast, in the meaning of the verb *clean* the notion of ‘becoming clean’ is an essential and hence non-deniable part, as seen in *I cleaned the shirt, but it came out dirty* (that is, where *clean* is not used in the sense of sending to the cleaners).

Fourth, the notion of ‘becoming clean’ that we find associated with *wash* cannot be present simply by virtue of being part of some larger metonymic frame, e.g., where *wash* would refer directly only to the action of immersion with agitation, which would act as a metonym for an expanded frame that further included getting clean, drying, and putting away. Evidence against such an interpretation is that it is perfectly felicitous to say *I washed the shirt and left it wet*, thus cancelling the ‘drying’ component of the putative frame, but it is not felicitous to say *??I washed the shirt and left it dirty*, which cancels the ‘making clean’ component, even though by the metonymic interpretation both these components are equally part of the frame.

Fifth, while pragmatic theory has a notion of "conventional implicature" that is associated with a lexical item, e.g., the implicature of ‘contrast’ that is associated with the morpheme *but*, this kind of implicature is not defeasible (cf. Levinson 1983). By contrast, the implicature of ‘becoming clean’ that is associated with *wash* is indeed defeasible, as in *I washed the shirt, but it came out dirty*, so that this cannot be an instance of conventional implicature.

By zeroing in this way on the implicational phenomenon exhibited by a word like *wash*, one must conclude that it is distinct from linguistic phenomena previously described. It is a defeasible implicature associated with a lexical item, and thus presumably part of the lexical content. I propose the term *lexicalized implicature* for this linguistic phenomenon.

6.4 Typological Difference in the Expression of Realization. Languages that systematically express realization appear to divide into the same two typological categories we have seen on the basis of whether the realization is expressed in
the main verb or in the satellite, and this assignment appears to align with that of the other framing categories. That is, satellite-framed languages that employ the satellite to express Path, temporal contour, changed state, and action correlation also extend that set to include realization, while verb-framed languages tend to employ the main verb to express the full set of five categories. Apparently, in the organization of conception for linguistic expression, realization is set into analogy with the other framing event types in something like the following way: as the space domain has motion from elsewhere to a particular location, and as the state domain has change from the absence to the presence of a particular property, so the realization domain has transition from a potential stage to an actualized stage of realization, or from an assumed degree to a definite degree of realization. Reinforcing the analogy, realization can, as we saw, be interpreted as a specialized kind of state change, pertaining to ontological and epistemic states. This analogy can be captured by the conceptual structure assumed for a realization-type macro-event, as schematized for fulfillment in (26a) and for confirmation in (26b).

(26) a. [Agent "MOVE" TO FULFILLMENT the INTENTION (to CAUSE X)]
    IN [Agent ACT + INTEND to CAUSE X THEREBY]

b. [Agent "MOVE" TO CONFIRMATION the IMPLICATURE
   of the FULFILLMENT of the INTENTION (to CAUSE X)]
   IN [Agent ACT + INTEND to CAUSE X THEREBY
   + IMPLICATURE of the FULFILLMENT of the INTENTION to CAUSE X]

Although the confirmation type of realization is minimal in English and many other familiar languages, some languages have an extensively developed system of lexicalized implicature and confirmation thereof. Two such languages are Mandarin and Tamil, representing the two typological categories of satellite-framed and verb-framed languages, respectively.

6.4.1 Mandarin: a Satellite-Framed Language Exhibiting Realization. Mandarin is a strongly satellite-framed language, regularly using its satellites to specify Path, aspect, state change, some action correlation, and much realization. Perhaps the majority of its agentive verbs are of either the fulfillment or the confirmation types of realization, with the latter apparently the more strongly represented. Some examples are in (27)-(29).

(27) a. wǒ kāi le mén (dàn-shí mén méi kāi)
    I open PERF door (but door not-PAST open)

b. wǒ kāi kāi le mén
    I open(V) open(Sat) PERF door
(28) a.  wǒ shā le tā  (dàn-shì méi shā sǐ)
     I kill PERF him (but not-PAST kill dead)

  b.  wǒ shā sǐ le tā
     I kill dead PERF him

(29) a.  wǒ tī le tā  (dàn-shì méi tī zháo)
     I kick PERF him (but not-PAST kick into-contact)

  b.  wǒ tī zháo le tā
     I kick into-contact PERF him

To explicate the semantics, the meaning of (27a) without the parenthetical addition is that I acted on the door in order to open it, with the implicature that the door in fact left the jamb. However, the interpretation that I did not succeed in moving the door from the jamb remains a possibility, one that has greater or lesser prominence in the hearer’s attention according to the context. For example, adult speakers report frequent suspicion of their children’s implicatures: child: "I opened the door", parent: "Yes, but did you open it open?". With the parenthetical addition, (27a) suggests that I worked at getting the door open, e.g., trying to get the key to turn, twisting the doorknob and shoving, etc, but that the door still never left the jamb. With the confirmational satellite in place in (27b), however, the sentence is now an undeniable assertion that I succeeded in moving the door from the jamb. Comparably, the first clause in (28a) means that I assaulted a person with the intention of killing him and with the deniable implicature that I succeeded. And the first clause of (29a) means that I kicked my foot out at someone with the intention of connecting and with the deniable implicature that I did make the impact.

Of course, the English verbs used to gloss the Mandarin verbs here, e.g., open, kill, kick, do not really correspond in meaning, hence they can be misleading. For example, a sentence gloss like "I killed him but he didn’t die" is genuinely paradoxical in English but thus incorrectly represents the non-paradoxical Mandarin original, which would be more closely rendered as "I assaulted him with intent to kill (and with what would otherwise have been the presumption of killing), but he didn’t die". The difference is that the English verb is generally construed to refer to a simplex action of the first verbal pattern -- in particular, to specify the attainment of a certain final state with neutrality as to the particular actions that led up to it. Accordingly, an English verb in the frame cited above leads to a paradox because the follow-up clause contradicts the verb’s assertion that its particular final state was attained. In Mandarin, by contrast, the referential terrain covered by a typical English verb is conceptually divided as in the third verbal pattern into two portions: the final outcome, conclusively confirmed by a satellite, and an action that is performed with the intention that it lead to that outcome, indicated by the verb. Accordingly, the unitary
referent of an English verb often has as a counterpart in Mandarin a two-part conceptualization expressed by a verb plus a satellite. Thus, we have already seen the counterpart of ‘kick’ as “propel the foot so as to impact with’ + ‘into impact”, of ‘kill’ as “assault so as to kill’ + ‘to death”, and of ‘open’ as “work on so as to open’ + ‘ajar”. In the same way, we observe the counterpart of ‘cure’ as “treat so as to cure’ + ‘to health (lit.: good)”’, of ‘break’ (e.g., snap a stick) as “squeeze circumpivotaly in upon so as to break’ + ‘broken”, and of ‘select’ as “deliberate over so as to choose among’ + ‘into choice”’.

6.4.2 Tamil: a Verb-Framed Language Exhibiting Realization. Tamil is a language that systematically expresses realization, but is the typological complement of Mandarin. Tamil is a verb-framed language using its finite-inflected verb for the expression of at least Path and aspect, as well as for the expression of realization. Unlike Mandarin, in which confirmation is indicated by any one of numerous satellites determined by the particular lexical verb that is present, Tamil uses a single specific verb to express confirmation per se (although apparently other verbs, mainly serving other functions, do also express confirmation). The examples in (30) illustrate.

(30) a. Nān avarai korun.  
    I he-Acc kill(Finite)-Past-1s  
    ‘I killed him.’

   Arāl avan cāka-villai.  
   but he die-Neg  
   ‘But he didn’t die.’

b. Nān avarai koru-(vi)tten.  
    I he- Acc kill(Non-Finite)-leave(Finite)-Past-1s  
    ‘I killed him.’

   *Arāl avan cāka-villai.  
   but he die-Neg  
   ‘But he didn’t die.’

7. Conclusion. This paper has omitted much material, already developed, that would extend the theoretical and cognitive framework and provide linguistic demonstration for more of the analysis. However, as it stands, I believe this paper has shown that there is psychological reality to a certain fundamental conceptual entity with possibly universal linguistic expression. This entity can be conceptualized either as a complex event, consisting in turn of a minor event related to a major event, or as a single fused event. The fact that this second alternative is readily expressed by core constructions in any language is evidence for our robust cognitive capacity to integrate certain large amounts and diverse kinds of conceptual material into a single monad. The body of this
paper has primarily been spent documenting the particular patterns and structuring of conceptual material that enter into the present specific process of monad formation. But as a whole, the paper is intended as a contribution on conceptual integration and unification as a fundament of human thought.

NOTES

1. With my thanks to them, the sources of the non-English forms cited are, for German, Elisabeth Kuhn, Luise Hathaway, and Wolfgang Wölck; for Mandarin, Jian-Sheng Guo; for Spanish, Jon Aske, Guiermina Nuñez, and Jaime Ramos; and for Tamil, Eric Pederson and Susan Herring. In addition, I am indebted to Eric Pederson, David Wilkins, Patricia Fox, and Ruth B. Shields for valuable discussions on the material of this paper.

2. Certain end-of-sentence gerundives in Spanish and certain -te constituents in Japanese may be interpreted syntactically as adverbial subordinate clauses, so that the overall construction would be a complex sentence, which could therefore not represent a macro-event. But both languages also have constructions with the supporting verb in direct construction with the main (framing) verb alone, thus rendering the whole sentence a single clause that now does represent a macro-event (cf. Matsumoto, 1991). The difference is seen, for example, in Spanish La botella salió de la cueva flotando and La botella salió flotando de la cueva. In Nez Perce, the supporting constituent is adjoined to the main verb root (the framing constituent) as a prefix, i.e., as an unmistakable satellite -- which can be termed a supporting satellite -- so that the whole sentence is now also unmistakably a single clause.

3. For Motion, this paper’s two-category typology concerns only whether the Path appears in the verb or in the satellite. The three-category typology in Talmí (1985) further subdivided languages with the Path in the satellite on the basis of which of two further macro-event components appears in the verb. The three-category typology thus concerns whether the verb expresses the Path (as in Spanish) or -- for Path-in-satellite languages -- the supporting event (as in English), or the Figure (as in Atsugewi).

4. This Spanish type was independently noticed by Jon Aske.

5. It remains to clarify why the syntactic pattern in Spanish for temporal contouring differs from that for Motion as to the constituent in which the supporting event’s Patient is expressed. For example, the Spanish for (3a) is not: *Terminé la carta, escribiéndola, “I finished the letter, writing it”.

6. For some English speakers, the away satellite indicates total disappearance, so that for them, The meat rotted away suggests nothing more than a brown stain left on the table. For other speakers, however, the satellite’s sense permits a residue.

7. The sense of together addressed here is that of ‘concert’ as contrasted with ‘accompanied’, not the sense of ‘co-location’ as contrasted with ‘separation’.

8. This type of verbal pattern was first described by Ikegami (1985) with respect to Japanese and was called to my attention for Mandarin by Jian-Sheng Guo.

REFERENCES.


Shifting of Reference-time and Perspective

Alice G.B. ter Meulen
Indiana University

1. Introduction

This paper reports on part of a research program to develop a linguistically satisfactory theory of informative content for natural languages. In such a semantic theory the interpretation of a sentence is the process of incorporating its new information content into the information which is already available or given before to the interpreter. It is crucial to recognize that the same sentence can be used in different contexts to give different information. If I say *I am happy*, the content of what I say differs from when you utter the same sentence. But not only do sentences with such clearly context-dependent expressions as the indexical *I* vary in content from context to context, but, for instance, any use of a tensed sentence is dependent for its reference on the moment of speech. Modals, counterfactuals, plain vanilla conditionals, as well as many quantificational sentences can be interpreted as having variable content, which depends on context and background assumptions.\(^1\)

In this paper I will focus on the way we incorporate descriptions of past events and states into given information. Not only does the temporal information encoded in the tense and aspectual properties of a sentence depend on the time of utterance, but, as we will see, what has been said before will constitute the interpretative background which is essential in determining the content of the new utterance.

The theory of informative content that I am after is intended to constitute a model of our semantic competence, the ability all competent speakers of a language share to understand what has been communicated in any given utterance of an expression of that language. Such a theory hence provides a characterization of what informative content a given use of a sentence or expression of another syntactic category has. It makes no claim as to how this content is determined by actual mental processing, which may well vary wildly in individual language users. Such how-claims I believe must be supported by experimentally gained evidence about behavior of language users in linguistic tasks - a research-assignment properly belonging to psycholinguistics and experimental branches of cognitive science. My work is armchair-research for which linguistic branches of cognitive science provide the empirical basis. The results of such theoretical investigations will provide constraints, predictions and fundamental concepts for further experimental research on linguistic behavior.

The theory of meaning I espouse makes a fundamental distinction between the interpretation of an utterance to determine its informative content and the evaluation of this content in a model of the external world. The semantic rules which play a role in determining content are of a different nature than those which are needed to evaluate the content for truth and denotation in a model. The latter kind of rules include rules of inference as operations on given information which preserve its assumed truth. In the evaluation of content we lay down what it takes for a situation to support the content of an utterance. This resembles to a certain extent the good old Tarskian satisfaction conditions in set-theoretic models, but then such models are enriched with partial situations and much more structure in their domain than in the 'flat' models we are familiar with from predicate logic. The technical details will not so much concern us here, since my focus is currently on the conceptual issues...
of the use of tense and aspect in telling events apart. It is important to note, however, that in this semantic theory there is no independently specified and artificial separation of the logical vocabulary of a language from its descriptive vocabulary. This blurs the boundaries between analytical and logical truths intentionally, since what is considered a necessary truth depends on a host of background assumptions which delimit the set of alternative situations open to the evaluation and possible inferences.

The final point that needs making in this introduction is that the semantics assumes that utterances of sentences describe events or states, and that such objects cannot be reduced without an important loss of semantic modelling power to a set of instants with an ordering over them. This non-reductionistic conception of events and states is what I call an event-based semantics, which provides the basic ontological structure of the representations. By way of justification of this choice I would like to adduce the philosophical consideration that our notion of measurable time is derivative on our perception of change in the world. In such an event-based semantics it is crucial to make clear how an event can be distinguished from another. I will not make the overly simplistic, but unfortunately rather common assumption that each utterance of a sentence describes an individual event. Such an approach would not only overpopulate the world, but it would also make what there is directly dependent upon what we say, which I believe to be an untenable position. Hence in the semantic theory I use an important distinction is made between an event and an event-type. Events are part of the world as much as we are, and they consist of other semantic objects (e.g. relations, individuals and polarities). But event-types are best understood as ways of classifying the world into similar parts in which the 'same thing' happens or is going on. An event may support a number of different event-types simultaneously, just like individuals can have many properties at the same time. Now the world does not come prepackaged into events, but we partition the continuous change into events, and encode such a divided domain into our reports of what takes place by using linguistic tools of tense and aspect, as well as adverbials and other forms of quantification. The different aspectual classes can be modelled by structuring event-types differently, and functions assigning structured semantic objects to parameters provide the flexible tools to do so.

2. How do we tell events apart?

Which linguistic tools do we have in English to indicate how events are ordered in time? When an event can have more than one description, the interesting question is what forces us to locate such event-descriptions in a temporal sequence. When we describe a certain episode in our past, we can use the simple past tense inflection to indicate that what the sequence of events was. As we see in (1), a sequence of three simple past tenses allows an interpreter to infer that what is said first also came first in the actual episode reported.

(1) a. Jane opened the door. She left the house and drove away.
   b. Jane left the house and drove away. She opened the door.

From (1a) we infer that Jane drove away after she had opened the door and had left the house. Similarly, from (1b) we infer that Jane opened the door after she had left
the house and after having driven away. The semantic properties of the simple past tense allow us to draw such inferences. The present (or past) perfect lacks this particular property, as illustrated in (2).

(2)  
a. Jane has opened the door. She has left the house. She has driven away.
   b. Jane has left the house. She has driven away. She has opened the door.

Neither in (2a) nor in (2b) is any temporal order indicated between events which caused current perfective states Jane is in. Since plain common sense tells us that the three things she did could not have been performed simultaneously, we are inclined to default to an ordering which corresponds with the ordering of the uttered sentences. But there is no real semantic requirement inherent to the meaning of the perfect to do so. In (3) a question with perfect inflection is answered by a sequence of sentences with perfect inflection. One cannot continue such a conversation by asking what came next, rather, if more information is requested, one asks for another perfect tense answer without indication of when what it describes took place.

(3)  
A: What have you done today?
B: I have seen my cousin, I have bought her a present, I have been to school and I have watched television.
A: What else did you do? / *What did you do next?

Although pragmatic grounds may exist to default to a specific temporal ordering between events described by uses of the perfect tense, on purely semantic grounds there is no need to do so. The meaning of the perfect only requires that there was a prior event which caused the present perfect state to arise by its ending. The events that are such causal sources of perfect states are ordered in time, and correspondingly the onset of perfective states are, but the states themselves need not be, as they continue to hold for ever after, once they have been caused. But the simple past does not always have this sequencing effect, since in (4) we infer, for instance, that Jane’s whistling took place while she was walking along the river.

(4)  
Jane walked along a river. She whistled a tune and jumped over a fence. When she came to a rabbit-hole ...

We also infer from (4) that Jane came to a rabbit-hole after she jumped over the fence. So the simple past tense in a first sentence can allow a next sentence to be interpreted as a temporal part of the event described by the first, as in (4) her whistling taking place during the walk, but the same tense also allows the next sentence to be interpreted as describing an event which comes after the event described by the first one. We will see that the aspectual properties of the sentences determine whether the use of the simple past tense has a sequencing effect in a particular context.

Note, by the way, that from a narrative in the simple past tense we only infer some of the temporal relations between the events described, not all. For instance, from (4) we get no clue whether Jane was still whistling a tune when she came to the rabbit-hole. Despite the fact that a text only gives us partial information about the temporal relations between what it describes, we can reason validly with such limited information.
In the semantic rule for the simple past tense we need to encode when the event described by it gets, as a manner of speaking, ‘closed’ to further specification of its temporal parts. Aspectual properties will be represented by closure-conditions on a given event which constrain the incremental development of the event-structure, disallowing representation of the temporal parts of that event within the given perspective. Closure of an event forces the next sentence to represent a next event. But any given perspective can be shifted to a finer grained one, in which such closed events can be opened again to display their internal structure. In the next section I will discuss such shifts of perspective and the differences between shifting in reference-time, which happens in sequencing, and perspectival shifts.

3. Divisibility and support

When an utterance of a sentence describes a next event, we will say that the reference-time is shifted to a ‘next’ time. The asaspectual properties of such event-descriptions matter crucially for such shifting, as the first sentence must describe what is happening as an event of the type which culminates or gets finished. Looking again at the examples we discussed above, we see in (1a) that opening a door is the kind of thing which incorporates a natural end point, namely the state in which the door is opened or simply open. This is why the next sentence she left the house is interpreted as describing an event which takes place after the door has been opened. Leaving the house is similarly an event which is completed or finished, and hence the third event-description represents a third distinct and next event. Such event-types which culminate or get finished are traditionally called ‘accomplishments’. I will say that an event e supports an event-type E indivisibly, when E, representing the content of the utterance, is not supported by any proper part of e, given the assignment under which e supports E. More technically formulated, the assignment of referents in e to the indeterminates or parameters in E is the smallest one possible in e, a lowest bound in the structured domain of part-whole relations between events. Of course, when an event e supports an event-type E indivisibly, there may be other event-types E' which are also supported by e or by parts of it. As a limit there are also events which are atomic in that within the given perspective no other event-types can be supported by parts of them. Such events represent the asaspectual class of achievements, events of which beginning and end point are indistinguishable within the given perspective. The way the asaspectual classes are represented relies only on the assignment functions under which an event supports an event-type, hence asaspectual properties are a matter of representation, not a metaphysical way of how things ‘really’ are. This makes it possible for an event to simultaneously support an event-type E indivisibly and another event-type E’ divisibly, as would be needed in any inference as in (5).

(5) Jane drank a cup of tea => Jane drank (some) tea

So far, we have seen support for the following conditional constraint on sequencing:

*Conditional constraint:*

If the content of an utterance of sentence S is represented by an event-type E and there is an event e that supports E indivisibly, then the content of the
utterance of the next $S'$ represented by an event-type $E'$ may be supported by an event $e'$ located after $e$.

This is quite a weak constraint on the construction of event-structures representing the partial information we gain about the temporal relations between the events described in a narrative text or discourse. None of the evidence based purely on the informative content of tense and aspect has provided a basis for any stronger constraint. But I will return to possible ways of strengthening this constraint below. Let's illustrate this constraint with a few more examples. In (6a and b) we see that the PP can contribute the crucial aspectual information. The representation of (6a) is an activity, divisibly supported by the event, since part of walking along the river is also walking along the river. In (6b) turning around the corner is an accomplishment, since no part of a turn around the corner is itself also a turn around the corner. Accordingly, the jump over the fence takes place during the walk along the river in (6a), whereas it takes place after she turned the corner in (6b).

(6)  
   a. Jane walked along the river. She jumped over a fence.  
   b. Jane turned around the corner. She jumped over a fence.

But it is important to realize that not every use of the VP turn around the corner needs to constitute an indivisibly supported event-type, for in (7a) we see that an existentially interpreted bare plural NP contributes to the constituency of the event-type representing the content of the whole sentence by making it supported divisibly. Part of what happened when people turned around the corner was still people turning around the corner, because part of people is people and turning around the corner is an action performed by individuals. Similarly when the NP in the PP is a bare plural, the event supports the event-type divisibly too. So in both (7a) and (7b) the fence-jumping takes place during the corner-turning. The past progressive has a very similar semantic effect. It indicates that the event-type is not completed in the event which supports it. In other words, the support is only partial; the event is part of a larger event which fully supports it. When the support relation is partial, it is divisible. So in (7c) too, the fence is jumped while the corner is turned.

(7)  
   a. People turned around the corner. They jumped over a fence.  
   b. Jane turned around corners. She jumped over fences.  
   c. Jane was turning around a corner. She jumped over a fence.

So why is the above conditional constraint hedging in that the next sentence may but need not represent a next event? When we look at more examples, we see that the indivisely supported event-type is not a necessary condition to shift the reference-time. In (8a) the first sentence by itself is surely interpreted as an accomplishment, for part of what Jane did when she played the sonata cannot be another playing of that same sonata. But her smiling may well occur during her playing of the sonata, but it need not. Here the semantic rules must be sufficiently flexible to allow for both interpretations. However, when the choice is made to locate the content of the second event after the playing of the sonata, no subsequent third sentence as (8b) can contribute an event-type that is supported by part of the first event. In other words, the determinacy returns after the ambiguity of where to locate the second event is resolved. If it is located after the first event, that one is
subsequently closed for any further specification of its temporal parts. We infer that Jane looked out of the window after she played the sonata and not during it.

(8) a. Jane played a sonata. She smiled.
    b. She looked out of the window.

There are contexts where the conditional constraint can be overruled by other constraints. One clear example of such a context is (9) where the second sentence gives a causal explanation for the event described by the first. Since causes commonly precede their effects in time, in (9) we interpret the content of the second sentence, either in past perfect or in simple past, as an event that starts before the event described by the first sentence starts.6

(9) Jane damaged a record. She (had) left it out in the sun.

The most important advantage of representing the aspectual classes which determine the temporal dependencies by properties of the support-relation is that it leads very naturally to a compositional account of how aspectual properties are projected in a sentence. Any expression of any syntactic category is represented semantically by a relation with an appropriate number of arguments and a polarity, and possibly some additional structure (e.g. parametrization over one of the ‘free’ indeterminates). If any one of the constituent event-types in the interpretation of a sentence is supported divisibly, then the sentential event-type will be too. It is like the weakest link in a chain: if one link is divisible, the entire chain is. This inheritance of divisibility can be formally rendered by composition of assignment-functions, but I will not enter into such details here. This claim is intended to be a testable prediction, requiring that indivisibility yields to divisibility independent of syntactic position. Further investigation of this claim is obviously needed, especially to see whether adjuncts participate without restrictions in this compositional process to determine aspectual properties of sentences.7

4. Shifting perspective and temporal subordination

Achievements, i.e. atomic events which are closed for temporal parts of any event-type, can be considered as having internal structure, but this requires a shift of perspective. In such a perspectival shift atomic events from a coarser perspective are represented as having internal structure. A perspectival shift creates a new tier of representation which is subordinate to the main tier. The event which is atomic in the main tier serves as a temporal container of the internal structure it displays in the subordinate tier. We will see that there are interesting semantic interactions between the main tier and the subordinate tier. Consider sentence (10):

(10) Jane jumped over a fence. She took one big leap and landed on the other side.

Jumping over a fence is typically considered an achievement; as soon as one jumps over a fence, one has jumped over a fence. No separation of beginning and end point is possible in the given perspective. But, of course, in natural language we can always specify what happened within an event however small or even atomic. In the second sentence in (10) this is done by lexical relations between the verb
phrase *jumping over a fence* and *taking one big leap*. Semantic lexical relations will tell us that taking a big leap and landing on the other side should be located as part of Jane's jump over a fence. Within the perspective in which *Jane jumped over a fence* is represented as atomic, the second sentence cannot be accommodated as describing events which are part of her jump. A new subordinate tier of temporal dependencies must be created. The atomic event in the given perspective is represented as having internal structure in the subordinate perspective and within that internal structure we represent the leap and the landing on the other side. Of course, within the subordinate perspective no part of the jump over the fence can be represented as located outside of the jump. Hence the temporal structure of the main tier needs to be inherited in the subordinate tier of representation. This is what I meant in saying that the atomic event serves as a temporal container for the internal structure represented in the subordinate tier. Besides describing internal structure of atomic events by lexical relationships, aspecual verbs can serve a similar semantic purpose. Consider sentence (11):

(11) Jane jumped over a fence. She *started* taking a few big steps, then ran, her feet lifted from the ground and continuing swift as a bird, *ended* landing safely on the other side.

The existential aspecual verb *start* serves to create a new subordinate tier of temporal dependencies in which the internal structure of the jump can be represented. Such a subordinate tier creates a "slow motion" effect in the narrative, as if time is suddenly slowing down to allow the display of the internal structure within the achievement. Within the subordinate tier the rules for temporal dependencies and temporal anaphora hold again, as in the main tier. So the simple past tense of *start* and the fact that taking a few big steps is an accomplishment requires the next simple past tense *ran* to be located after the big steps, even if the sequencing adverbial *then* is not present. Similarly *her feet lifted off the ground* is the next description of an event in the past and the aspecual verb *continuing* allows us to interpret the sequence as constituting the internal structure of the same event, concluded by the aspecual verb *ended* which again is existential but with a negative polarity.8

It is important to note that only a positive existential verb like *start* or *begin* can shift the perspective to a subordinate tier, for a universal aspecual verb *continue* or *keep* remains in the given perspective, as we see illustrated in (12).

(12) Jane jumped over a fence. She *continued* her walk./ She *kept* walking.

Jane's walk is continued after jumping over the fence in both interpretations of the second sentence; no subordinate tier is created. Such universal aspecual verbs share an interesting semantic characteristic with static verbs. They are interpreted as an event which contains the event described by the preceding sentence. In other words, in the interpretation of (13) jumping must be part of the whistling.

(13) Jane jumped over a fence. She continued to whistle./ She kept whistling.

The difference between *continue* and *keep* shows up when we realize that *continue* allows gaps and hence the jumping may interrupt her whistling but need not,
whereas for keep the jumping must be part of whistling and the whistling goes on throughout the jump.
Of course, shifting perspective can be effected too by certain classes of adverbs as we see in (14) and (15).

(14) Jane jumped over a fence. She first took a few big steps,...

(15) Jane jumped over a fence. She first took a few big steps,...She managed to clear it by a few inches and landed safely on her feet.

The second sentence in (14) and (15) is interpreted as representing the internal structure of the jump over the fence, because it goes back to the initial beginning point and starts a subordinate tier where the big steps are represented. Whatever subsequent information will continue that subordinate chain sequence of events until a negative aspectual verb or an adverb like finally or at last indicates that the subordination is completed and the representation reverts to the main tier. In (15) we see that the presupposition of manage, namely that it was difficult to do so, is accommodated in the main tier. The sentence she managed to clear it by a few inches is represented in the subordinate tier after the big steps. The presupposition that it was hard for Jane to clear the fence is inherited in the main tier and accommodated as that it was hard for Jane to jump over the fence, because clearing the fence entails that you jumped over it.
There are interesting restrictions on anaphoric dependencies between antecedents in the subordinate tier and pronouns in the main tier. In (16) we see that the VP-antecedent touched a pole can provide the right content to interpret the pronoun in the main tier in the sentence it had not hurt her.

(16) Jane jumped over a fence. She started by taking a big step, ..., her foot barely touched a pole ... and she landed safely on her feet. It *did/had not hurt her.

Such pronouns in the main tier which are bound by antecedents in the subordinate tier must occur with a VP which denotes a perfect state, and do not accept event-descriptions in the simple past tense, as we see in (16). A further explanation of this restriction is given in my forthcoming book. However, such pronouns can occur with simple past tenses, if they describe stative situations, simple stative properties like being taller than she had thought, which describe permanent properties of the referent of the pronoun. In (16) a pole is an antecedent introduced in the subordinate tier binding the pronoun in the main tier.\(^9\) The pronoun hence is interpreted as coreferential with the pole, but to establish such coreference, the property attributed to the referent of it must be a permanent simple stative property or a perfect one.
I hope to have indicated that there are some interesting semantic interactions between the main tier and the subordinate tier. The issues deserve further exploration but this is beyond the scope of the present paper.
Notes

1 This is what Robert Stalnaker calls the 'common ground' of the information exchange. See Stalnaker (1978).
2 The argument against a reductionistic semantics of tense has been most compellingly presented in the contemporary literature by Hans Kamp, see Kamp (1979), (1980), (1981) and Kamp and Rohrer (1983). I am heavily indebted to this research in developing my own views and analyses.
3 Donald Davidson has developed an event-based semantics with primitive events, but I see clear advantages to a semantic theory with defined events and event-types for reasons I cannot go into here, but which are related to the goals of a compositional semantic theory, which I am not sure Davidson shares.
4 I have presented an account of structured events to model aspeclual classes in earlier published work, see references.
5 See for instance Hinrichs (1986) and Partee (1984) for a different formal treatment of temporal anaphora of the various aspeclual classes.
6 I have a clear preference for the past perfect in (9), but apparently native speakers of English allow a simple past as well.
7 Such further research is reported in my forthcoming book, Representing Time in Natural Language.
8 See ter Meulen (1990) for an analysis of aspeclual verbs as generalized quantifiers in which start is existential and finish is negative existential and continue and keep are universal quantifiers.
9 We know that we are back at the main tier as the completion of the jump over the fence is being described by her landing safely on her feet in prior text.
References


The Berkeley Linguistics Society is a graduate student organization at the University of California, Berkeley. The Society holds its annual meeting during Presidents’ Day weekend in the middle of February. The meeting consists of three parts: a General Session on topics of varied linguistic interest, a Parasession on a particular linguistic topic, and, beginning in 1990, a Special Session on general linguistic topics of a certain geographic area. Around the middle of September, a Call-for-Papers is sent to those on our mailing list, and abstracts of papers are due around the middle of November. After reviewing and selecting the abstracts, the Society sends out the conference program in early January. The Proceedings of the conference are published yearly by the Society and become available in the fall. Order forms for proceedings are mailed with the Call-for-Papers and can be obtained from the above address. All orders require prepayment.

**Book Prices**

<table>
<thead>
<tr>
<th>Parasession Topics</th>
<th>Individuals</th>
<th>Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLS-1 (1975)</td>
<td>$7.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>BLS-2 (1976)</td>
<td>$6.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>BLS-3 (1977)</td>
<td>$6.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>BLS-4 (1978)</td>
<td>$6.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>BLS-5 (1979)</td>
<td>$6.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>BLS-6 (1980)</td>
<td>$6.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>BLS-7 (1981)</td>
<td>$6.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>BLS-8 (1982)</td>
<td>$10.00</td>
<td>$14.00</td>
</tr>
<tr>
<td>BLS-9 (1983)</td>
<td>$6.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>BLS-10 (1984)</td>
<td>$10.00</td>
<td>$14.00</td>
</tr>
<tr>
<td>BLS-11 (1985)</td>
<td>$10.00</td>
<td>$14.00</td>
</tr>
<tr>
<td>BLS-12 (1986)</td>
<td>$10.00</td>
<td>$14.00</td>
</tr>
<tr>
<td>BLS-13 (1987)</td>
<td>$11.00</td>
<td>$15.00</td>
</tr>
<tr>
<td>BLS-14 (1988)</td>
<td>$12.00</td>
<td>$16.00</td>
</tr>
<tr>
<td>Theoretical Issues in Language Reconstruction</td>
<td>$12.00</td>
<td>$16.00</td>
</tr>
<tr>
<td>BLS-16 (1990)</td>
<td>$16.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>BLS-16S (1990)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Session on General Topics in American Indian Linguistics</td>
<td>$8.00</td>
<td>$12.00</td>
</tr>
<tr>
<td>BLS-17 (1991)</td>
<td>$16.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>BLS-17S (1991)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Session on African Language Structures</td>
<td>$8.00</td>
<td>$12.00</td>
</tr>
<tr>
<td>Author Index to BLS 1-16S</td>
<td>$2.00 (includes shipping)</td>
<td></td>
</tr>
</tbody>
</table>

**California Sales Tax**

- 8.25% for residents of Alameda, Contra Costa, Los Angeles, San Diego, San Francisco, San Mateo, Santa Clara, and Santa Cruz counties
- 7.75% for residents of Fresno, Imperial, Inyo, Madera, Monterey, Orange, Riverside, Sacramento, San Benito, San Bernardino, San Joaquin, and Santa Barbara counties
- 7.50% for residents of Sonoma county
- 7.25% for all other California residents

**Shipping and Handling**

<table>
<thead>
<tr>
<th></th>
<th>Within USA</th>
<th>Outside USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLS 1,2,6,7,9,11,12,13,14,15,16S,17S</td>
<td>$2.00</td>
<td>$3.00</td>
</tr>
<tr>
<td>BLS 3,4,5,8,10,16,17</td>
<td>$2.50</td>
<td>$4.00</td>
</tr>
</tbody>
</table>

ORDERS MUST BE ACCOMPANIED BY PAYMENT

Make checks and money orders payable to the Berkeley Linguistics Society