PROCEEDINGS OF THE TWENTY-SIXTH ANNUAL MEETING OF THE

BERKELEY LINGUISTICS SOCIETY

February 18-21, 2000

GENERAL SESSION

and

PARASESSION ON ASPECT

Edited by

Lisa J. Conathan
Jeff Good
Darya Kavitskaya
Alyssa B. Wulf
Alan C. L. Yu

Berkeley Linguistics Society
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GENERAL SESSION
The Distribution of French Raising Constructions

MICHEL ACHARD
Rice University

1. Introduction
The French subject-to-subject raising verbs appear in the two structures illustrated in (1) and (2).

(1) *Il semble que Jean comprend enfin*
   ‘It seems that John understands’
(2) *Jean semble enfin comprendre*
   ‘John finally seems to understand’

In the unraised construction in (1), the impersonal *il* is the main subject. *Jean* is the subordinate subject, and the subordinate verb is in the indicative mood. In the raised construction in (2), *Jean* is the main subject, and the subordinate verb is in the infinitive mood.

Most of the research has so far been concerned with the structure of the raised construction (Postal 1974, Ruwet 1972, 1983, Rooryck 1990, Achard to appear), but the conditions of occurrence of the two structures in discourse have received little attention. In this paper, I investigate the distribution of the raised and unraised constructions with the verb *sembler* ‘seem’ in a corpus of articles from the newspaper *Le Monde*. Using the concepts made available by the theory of Cognitive Grammar (henceforth CG, Langacker 1987, 1991), I show that each construction’s meaning strongly predicts its distribution in text, and that the results of the corpus analysis confirm that prediction.

This paper is structured in the following fashion. Section two introduces the meanings of the raised and unraised constructions. Section three presents their distribution in text. Section four summarizes the results and concludes the paper.

2. Meaning of the two constructions
In CG, the meaning of a linguistic expression is characterized as the specific construal its presence imposes on a conceptual base. Because *sembler* is an epistemic verb that evaluates the possible occurrence of a given event or
proposition in reality, our folk conception of reality represents the base relative to which the meaning of the unraised and raised constructions needs to be evaluated.

In our model of reality, certain facts can only be discovered if people make the conceptual effort to seek them out. Others, however, become available for anyone to see with no particular effort on any conceptualizer’s part. Sembler codes such situations where reality reveals itself, if only imperfectly and selectively.

The lack of conceptual effort on its subject’s part allows sembler to exhibit maximum transparency with respect to subject choice. Langacker (1995:40) characterizes transparency as follows: “any element that can occur in the appropriate position in the subordinate clause can likewise occur in ‘raised’ position in the main clause”. Because sembler profiles the coming into view of a particular scene (a possible facet of reality), the only entities available as its potential subject are elements of that scene. The choice between the raised or unraised construction depends on what entity receives focal prominence.

With the unraised construction in (1), the sentence profiles the speaker’s evaluation of the proposition Jean comprend enfin as a potential candidate for insertion into current reality. That insertion is only possible if the proposition doesn’t conflict with the other aspects of current and past reality that relate to it. At the very least, it can only be considered true if Jean’s current behavior is different enough from his past behavior to indicate a true change in understanding. The proposition is therefore embedded in a sub-section of reality that enables the speaker to identify it as a possible part of that reality. In Achard (1998 Chapter 7) I propose that the impersonal il codes the abstract setting identifiable as that sub-section of reality.

The unraised construction should thus be analyzed as a setting subject construction (Langacker 1991, Achard 1998 Chapter 7). The abstract setting is given focal prominence and thus marked as the subject, and the event or proposition as a whole (including its main participant) is viewed as the secondary figure and marked as the landmark. The main verb therefore profiles a relation between a specific sub-part of reality and an event or proposition that can be identified within it.

In the raised construction in (2), the main character in the located event is taken as the traejctor of the main relation due to its focal prominence. The process she participates in is viewed as the landmark of that relation. Unlike the case with the unraised construction, reality remains an unprofiled part of the base.

This analysis might seem surprising because Jean appears to be the logical subject of comprendre rather than sembler, since the subject of sembler is usually not a person but an event (Langacker 1995). Rather than being problematic, however, this particularity points to the very essence of the raised construction. In order to fully understand its semantic import, we need to recognize Langacker’s

1 These situations are usually coded by control verbs. This position is congruent with the well-attested semantic restrictions imposed on the subject of those verbs.
notion of the active zone of an entity, defined as: “those facets of an entity capable of interacting directly with a given domain or relation.” (Langacker 1987:485). In the raising construction, the complement process (comprendre) represents the subject’s (Jean) active zone with respect to its participation in the main relation. It is with respect to the process of comprendre that Jean can be considered the subject of sembler. To put things differently, the main subject represents the reference point with respect to which the process in the complement can be accessed. We will see in the next section that the subject’s reference point function (Langacker 1995) represents an important aspect of the raised construction’s meaning.

3. Distribution of the two constructions
The relation between the raised and unraised variants of raising verbs is ultimately a matter of speaker choice, and therefore impossible to predict completely. However, the meaning of the constructions makes a strong prediction as to their distribution in discourse. In his analysis of English raising, Langacker (1995:37–38) expresses that prediction in the following way:

It is claimed that, in Don is likely to leave, Don functions as a reference point with respect to the process of his leaving: the notion of leaving is accessed via the conception of Don and conceived in relation to that individual. The reference-point relationship is absent in the corresponding sentence That Don will leave is likely, which consequently has a slightly different meaning. The ‘raised’ NP can be thought of as a kind of local topic, i.e. a topic for purposes of ascertaining the actual (or direct) participant in the profiled main-clause relationship (Don calls to mind a process involving Don, and such a process can be accessed for likelihood). It makes the prediction that raised NPs should tend to exhibit greater ‘topicality’ than their unraised counterparts.

The remainder of this paper tests this prediction for French. The data consist of 300 examples of raised and unraised variants of sembler from articles published in the French newspaper Le Monde between 1988 and 1990. For both variants, the main participant in the conceptualized scene (coded as the raised nominal in the raised construction and the subordinate subject in the unraised construction) was analyzed for its ‘cognitive availability’. That term was chosen over Langacker’s ‘topicality’ to stress the fact that we are not solely concerned with the nominal’s discourse status, but with a more general notion of conceptual prominence. In the following analysis, available information includes discourse topical, as well as inferrable information. Nominals were ranked for topicality using Givón’s notions of ‘anaphoric accessibility’ and ‘cataphoric persistence’ (Givón 1995). They were categorized as inferrable if they code information that hasn’t been evoked in prior discourse, but that the speaker believes the hearer can

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2 Inferrable and topical information have been independently been shown to have similar distributional properties. For example, Birner (1997:138) argues that with respect to English inversion: “the distribution of inferrable information matches that of explicitly evoked information.”
plausibly infer from information that was previously evoked (Birner 1994, 1997, Prince 1992).

The results are provided in (3)–(5). The table in (3) concerns the overall distribution of raised and unraised constructions with *sembler*.

(3) Distribution of raised and unraised constructions

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (Raised variant)</td>
<td>205</td>
<td>68.33%</td>
</tr>
<tr>
<td><em>il</em> (Unraised variant)</td>
<td>95</td>
<td>31.66%</td>
</tr>
</tbody>
</table>

The table in (4) concentrates on the availability of *sembler*’s subject in the 205 examples of raised constructions.

(4) Subject availability in the raised construction

<table>
<thead>
<tr>
<th>Raised variant</th>
<th>Topical</th>
<th>Inferrable</th>
<th>Non-topical</th>
<th>Relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>116</td>
<td>39</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>%</td>
<td>56.58%</td>
<td>19.02%</td>
<td>12.19%</td>
<td>12.19%</td>
</tr>
</tbody>
</table>

The table in (5) is concerned with the availability of the subject of the complement clause in the 95 cases of unraised constructions.

(5) Subordinate subject availability in the unraised construction

<table>
<thead>
<tr>
<th>Unraised variant</th>
<th>Topical</th>
<th>Inferrable</th>
<th>Non-topical</th>
<th>Relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>37</td>
<td>8</td>
<td>49</td>
<td>1</td>
</tr>
<tr>
<td>%</td>
<td>38.94%</td>
<td>8.42%</td>
<td>51.57%</td>
<td>1.05%</td>
</tr>
</tbody>
</table>

Tables (4) and (5) show that our hypothesis fares differently with the two constructions. It is clearly confirmed with the raised construction. When topical and inferrable nominals are grouped together, the subject of *sembler* is cognitively available in 75.60% of the cases. The situation with the unraised construction, however, is not as convincing. We would expect the subject of the complement clause to be neither topical nor inferrable, but this is only the case in 51.57% of the cases. In 47.36% of the cases, it is either topical or inferrable. These numbers are certainly not enough to lend strong support to the initial hypothesis.

In the remainder of this section, I show that our original prediction receives much stronger support when the examples that seem to challenge it are carefully examined. I will first concentrate on the cases (12.19%) where the subject of

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3 Even though it will not be discussed here, the 'relative clause' category was created because the specific form and function of that construction seems to make it particularly well suited for the selection of the unraised construction, regardless of the availability of the relative pronoun's antecedent.
**Distribution of French Raising Constructions**

*sembler* is unexpectedly not cognitively available. I will then turn to the cases (47.36 %) where the subject of complement clause is topical or inferrable.

### 3.1 Raised variant with non-topical subjects

In 25 cases, contrary to expectations, the subject of the raised construction is not topical or inferrable. In these cases, however, some specific local condition of the surrounding discourse, or some semantic characteristics of the nominal itself acts as a primer and enhances its cognitive availability. These conditions motivate its use as the subject of the raised construction. This analysis is confirmed by the fact that the 25 unexpected cases naturally fall into a small number of rhetorical or stylistic patterns that exhibit a surprising degree of similarity. Furthermore, each pattern's form or meaning can be shown to booster the nominal's availability. Space considerations prevent me from considering each pattern in detail, but this section examines three representative samples.

The first condition that enhances the nominal's availability is the formal structure of the surrounding discourse. In 5 of the 25 cases, the subject of *sembler* is part of a list or a symmetrical structure in the narration. Being part of a set structure increases a nominal's salience and availability because the hearer can anticipate its occurrence on the basis of that structure. Any recurring pattern creates slots to be filled by specific entities. The existence of these slots results in the hearer's expectation for them to be filled by compatible entities, and thus in these entities' increased availability. This is illustrated in example (6).

(6) France-Télécom, pour sa part, affiche un chiffre d' affaires en hausse de 7 %, à 94,4 milliards de francs. Le parc téléphonique s'est encore accru, de plus d'un million de lignes pour atteindre 27 millions d'unités. A noter que 1,8 million d'abonnés (+ 42 %) ont opté pour la facturation détaillée. D'ailleurs depuis 1983, le taux de réclamations sur factures a été divisé par dix. En outre, la qualité du téléphone s'améliore aussi : moins d'un dérangement tous les sept ans en moyenne par ligne. Côté téléphone public, le nombre de cabines à cartes a augmenté d'un tiers, et 43 millions de télécartes ont été vendues (+50 %). La substitution des cabines à pièces par les publiphones à carte semble avoir vaincu le vandalisme : le taux moyen de dérangement dans les publiphones est tombé à 1 %.

'France Telecom, for its part, is showing earnings of 94.4 billion francs, a 7 percent increase. The telephone network has still increased by over one million lines to reach 27 million units. Note that 1.8 million of customers (+42%) chose the detailed invoice. In any case, since 1983, the complaint rate about invoices has decreased by a factor of 10. Besides, the quality of the service has also improved: less than one malfunction every seven years on average per line. As for public phones, the number of card phones has increased by one third, and 43 million of telecards have been sold (+50%). The replacement of coin phones by card phones seems to have defeated vandalism: the average malfunction rate of public card phones dropped to 1%'

5
Example (6) represents a point by point positive evaluation of the company France Telecom. Each item that characterizes the company is investigated and quantified (in bold in the text), all the elements adding up to a positive evaluation. The narrative is structured as a list format where each point under investigation is coded as the subject of the clause in which it occurs. The subject of semblor (underlined in the text) is a member of the overall list. It is non-topical, because it has never been mentioned in the preceding discourse. It is not inferable either, because it is not part of any obvious abstract telephone company schema.4

However, its position as the subject of semblor is strongly motivated by its being part of the list of the items to be evaluated. The reader has become accustomed to the structure of the text, and she therefore anticipates that whatever aspect of the company is being scrutinized will be coded as the main subject of the sentence in which it occurs. Despite its own lack of discourse topicality, the subject of semblor therefore has a fair amount of cognitive availability due to the presence of a specific structural slot that it is expected to fill.

In order to understand the second factor that motivates the presence of a non-topical subject of semblor, we need to make specific one important consequence of the meaning of the two constructions as it was presented in the preceding section. The choice of the raised variant involves reduced conceptual distance between the conceptualizer and her object of conceptualization because her initial contact with the complement process is made directly with a participant in that process, or an entity directly inferable from the context. In discourse, this characteristic of the construction represents a useful way of maintaining textual continuity by introducing new information through familiar entities used as reference points. Conversely, with the unraised variant, the complement process can only be located through the consideration of the more abstract notion of reality. The distance between the conceptualizer and her conceptualization is thus increased.

In an unexpectedly large number of cases (13), the subject of semblor’s raised variant is a nominal such as personne ‘nobody’, rien ‘nothing’, quelque chose ‘something’ etc. that will be called ‘indefinite’ because it does not refer to a specific entity. These nominals are illustrated in (7) and (8).

(7) Mr Modrow a mis en garde l’opposition contre une politique d’obstruction qui paralyserait l’action du gouvernement, lui refusant tout droit de veto sur celle-ci. Rappelant qu’il avait proposé aux formations d’opposition de nommer des représentants pour assister le responsable chargé du démantèlement de l’ancienne STASI, Mr Modrow leur a offert, jeudi, d’entrer directement au gouvernement avec “des personnes compétentes” de son choix. Les réactions ont été généralement négatives. Le refus du premier

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4 During the question period at the conference, Ellen Prince pointed out to me that these ‘list’ cases could be analyzed as a particular kind of inferable information. Her comment is fully congruent with the analysis proposed here.
ministre de revenir sur sa décision de reconstituer une nouvelle structure de renseignement promettait une empoignade pour la prochaine réunion de la table ronde, lundi 15 janvier, entre représentants du gouvernement et de l'opposition. **Personne ne semblait** pourtant réellement vouloir prendre, pour le moment, le risque d'une rupture. L'opposition semble penser que, quelles que soient les raisons de se méfier du gouvernement, un éclatement de la table ronde provoquerait une radicalisation de la situation que tout le monde redoute.

'Mr. Modrow threatened the opposition against a stalling policy which would paralyze the government's action, and denied them any right to veto that action. He reminded the opposition parties that he had suggested they nominate representatives to assist the person in charge of dismantling the former STASI, and offered them on Thursday to become part of the government with "competent people" of his choice. Reactions were generally negative. The prime minister's refusal to reconsider his decision to form a new intelligence agency promised to start some confrontations during the next meeting of the round table between representatives of the government and the opposition on Monday January 15th. However, for the moment, **no one seemed** ready to risk a breakdown in the discussion. The opposition seems to think that whatever reasons there are to be suspicious of the government, a breakdown of the round table would trigger the radicalization of the situation everybody fears.'

(8) *A l'heure où l'art est religion, où les musées s'élèvent comme les cathédrales d'antan, rien ne semble échapper à ce phénomène de sacralisation.*

'At a time when art is religion, when museums are erected like the cathedrals of older times, **nothing seems** to escape this phenomenon of sacralization.'

The nominals illustrated in (7) and (8) pertain to the existence of an entity rather than its identification. For example, in (7), personne denies the existence of any individual possessing the qualities expressed in the complement. These nominals are so frequently attested as subject of sembler because, even when they are not topical or inferrable, their presence doesn't impede the natural continuity of discourse. First, they often recapitulate the set of characters presented in the immediate context. This is most evident in (7) where personne obviously refers to each of the representatives of the government and the opposition. Secondly, even when they don't summarize a set of textual participants as in (8), these indefinite nominals do not introduce a disruptive new entity in subject position, and can thus easily be tolerated in the raised construction.

Finally, the presence of a subject in the raised construction that is neither topical nor inferrable can simply be part of the speaker's strategy to get a specific point across. This is illustrated in (9).

(9) *Les Fidjiens n'ont pas de système ou de dogme sur l'ovale. Pas de théoriciens. Ils ont seulement une capacité inouïe à occuper l'espace,* à
changer la dimension du jeu, à perpétuer le mouvement. Est-il besoin dans ces conditions d’un pack classique ? En dépit de la malice d’un Dominique Erbani et de la rigueur d’un Peter Winterbottom, les avant-barbarians ont terminé la partie sur les rotules sans avoir pu un seul instant prendre l’ascendant dans les phases statiques de conquête. Jusqu’à présent un seul homme semblait réunir toutes ces qualités : Serge Blanco, l’arrière du Quinze de France, que certains considèrent comme le meilleur du monde à ce poste. Or les Fidjiens en ont quinze comme lui à la parade sur le terrain.

‘The Fijians have no system or dogma about Rugby. No theoreticians. They simply have an uncanny ability to occupy space, to change the dimension of the game, and keep it in motion. Is there any need for a classic pack under these conditions? Despite the cunning of Dominique Erbani and the rigor of Peter Winterbottom, the barbarian forwards finished the game exhausted without ever being able to dominate the static phases of the game. Up until now, only one man seemed to gather all these qualities: Serge Blanco, the full back of the French team, that some people consider the best in the world at this position. However, the Fijians have fifteen like him ready to go on the field.’

The article from which the example in (9) is extracted is about the Rugby players from Fiji, and their extraordinary qualities. The nominal un seul homme is not topical or inferrable, but its use as the subject of sembler serves a clear stylistic purpose. The author makes use of the reference point function of the subject in the raised construction to manipulate the reader into thinking in a certain way.

The general purpose of the article is to present the Fijian players as different and noticeably better that the best players in the world. The beginning of the passage describes the qualities that allow them to stand out. However, mere description is not enough. The author wants to press his point more dramatically and resorts to comparison with specific players that the readers might better identify with. He therefore creates a local topic, invoked for the sole purpose of that comparison. This strategy is so far fully congruent with the selection of the raised construction.

The selection of un seul homme as the subject of that construction, however, deserves to be further explored. At first sight, it may seem to be a rather poor choice, because it provides little help in restricting the search domain within which the process in the complement (réunir toutes ces qualités) is located. Serge Blanco would have been a more efficient reference point, because its use would instantly bring up the mental image of the player and his qualities, and thus facilitate the access to the complement process. This is precisely why the author didn’t select it.

His whole dramatic comparative strategy consists in stating that with respect to a specific set of qualities, every single one of the 15 Fijian players is as good as the uncontested number one non-Fijian in the world. The use of un seul homme
allows him to directly compare the numbers 1 and 15 for dramatic effect. Furthermore, the reference point function of the subject of *sembler*, as well as the poor quality of *un seul homme* to perform that function combine to create a sense of suspense in the identification of the player. By using a poor reference point, the author forces the reader to explore each player that might fit the description, and thus realize how limited the choice is. It ensures that the reader will spend time on the location of that unique player, and it will strengthen his argument. The mention of *Serge Blanco* signals the end of the search.

3.2 Unraised variants and topical subjects
In 47.36% of the cases (45 examples), the subject of the complement clause is topical (37 cases) or inferrable (8 cases). In order to understand these cases, it is important to remember that if we compare the two constructions, the presence of the unraised variant involves additional distance between the conceptualizer and the conceptualized scene, because the latter can only be located through the consideration of the sub-part of reality within which it occurs.

This section shows that in the cases where the main participant in the conceptualized scene is topical or inferrable, the speaker uses the unraised construction to increase the distance between the conceptualizer and the conceptualized scene. That choice is made in response to specific features of the situation, or simply for strategic reasons. This position is confirmed by the fact that in all the examples where the subordinate subject is available, the desire to increase the distance between the conceptualizer and her conceptualization is clearly visible independently of the choice of the unraised construction. Here again, the data naturally divide themselves into specific patterns where formal and lexical characteristics of discourse conspire to motivate the selection of that construction. This section presents three of these patterns.

In the first set of examples, the break in the continuity of discourse characteristic of the unraised construction indicates a shift in topic. The subject of the complement clause is reactivated as a new topic, even though it was already topical earlier in the text. This is illustrated in (10).

(10) *Quarante-trois personnes sont mortes dans la nuit du samedi 13 au dimanche 14 janvier, lors de l’incendie d’une boîte de nuit à Saragosse, à quelque 300 kilomètres au nord-est de Madrid. Cent trente personnes environ se trouvaient dans l’établissement au moment de la catastrophe. Le feu a pris peu avant 3 heures du matin, apparemment à la suite d’un court-circuit dans une petite salle servant à contrôler l’installation électrique et située juste à côté de la sortie d’urgence. Aussi, nombre de clients qui tentèrent de s’enfuir par cette voie durent-ils refuser en désordre vers le centre de la pièce brusquement plongée dans l’obscurité. Seule la porte de service principale permettait d’échapper à l’incendie. Les flammes dégagèrent rapidement une fumée acre qui envahit en quelques secondes tout l’établissement par l’intermédiaire du système*
d’air conditionné. Il semble d’ailleurs que la quasi-totalité des victimes aient péri asphyxiées et non carbonisées. Certaines d’entre elles ont été retrouvées encore assises sur leur chaise, ce qui montre combien la suffocation a été rapide.

‘Forty three people died in the night of Saturday 13th to Sunday January 14th in the fire that destroyed a night club in Saragossa, approximately 300 kilometers North East of Madrid. Approximately one hundred and thirty people were in the building when the catastrophe occurred. The fire started shortly before 3 a.m., apparently due to a short circuit in a small room located right next to the emergency exit, used to control the electrical equipment. Several customers who tried to escape that way therefore had to rush back toward the center of a room suddenly plunged into darkness. Only the main service door could be used to escape the fire. The flames immediately released an acrid smoke that spread throughout the entire building in a few seconds through the air conditioning system. It seems, in fact, that the quasi totality of the victims died of asphyxia rather than burns. Some of them were found still sitting on their chair, which indicates how rapid suffocation was.’

The text in (10) represents the beginning of the article. The first sentence presents all the protagonists (fire, victims, outcome), and the rest of the narration merely elaborates on that introduction. The subordinate subject of the unraised construction (underlined in the text) is obviously available, because its referent (the victims) is clearly the topic of the first sentence. However, when they appear in the unraised construction, the victims no longer constitute the focal point of the discourse.

The use of the unraised variant is thus motivated by the text’s information structure. After presenting a brief summary of the disaster in the first sentence, the author shifts the emphasis to the fire itself, describing first its origins, and then the toxic properties of the fumes, as well as the way in which they propagated themselves. It is only with the evocation of the fumes that the author shifts back to the victims and the way in which they died. The presence of d’ailleurs ‘in fact’ provides a link back to the former topic, and the use of that link is a clear indication that the victims are no longer topical, because they need to be specifically reconnected to the current topic.

The presence of the unraised variant of sembler therefore enables the author to reintroduce the victims as focal elements of the text by treating them as new information. Once they have been reintroduced, they can be used as the subject of the next sentence. Despite the fact that it conveys available information, the nominal la quasi totalité des victimes does not appear as the subject of sembler because it is no longer the local topic of the immediately preceding discourse.

Also note that the use of the unraised variant makes explicit the shift from the description of the accident to the analysis of its possible source. The deductive process that leads the author to the conclusion expressed in the complement is
based on the observation of a particular facet of reality, namely the fact that some of the victims were still sitting on their chairs. Her reasoning is thus most efficiently coded by a construction that profiles the sub-part of reality that contains that facet as a focal point. In this case, the conceptual distance inherent to the unraised construction mirrors the distance between narration and analysis.

The second kind of situation that motivates the use of the unraised construction despite the availability of the main participant in the conceptualized scene is illustrated in (11) and (12).

(11)  

La compagnie américaine Northwest Airlines a décidé de supprimer ses vols entre la Scandinavie et les États-Unis en mars prochain. Trente-quatre des trente-huit employés de ses bureaux de Copenhague (ville terminale de ses vols) ont reçu leur lettre de licenciement. La Northwest Airlines, implantée au Danemark depuis 1979, desservait jusqu'ici une série de routes directement avec l'Europe du Nord et une série de villes américaines à des prix défiant toute concurrence. L'été passé, un billet Copenhague–New-York revenait à quelque 3 000 mille couronnes (environ 2 500 francs). Selon certains experts, Northwest Airlines aurait baissé les bras, victime d'une guerre sauvage des prix entre différentes compagnies privées et d'un remplissage insuffisant l'hiver hors de la saison touristique. Mais surtout il semble que les dirigeants de la compagnie craignent de voir leurs installations de Copenhague soumises, à plus ou moins long terme, à des représailles à la suite de la condamnation de quatre terroristes à Stockholm, le 21 décembre dernier.

'The American company Northwest Airlines decided to cancel its flights between Scandinavia and the United States next March. Thirty four out of the thirty eight employees of its Copenhagen office (the terminal city for its flights) were let go. Northwest Airlines have been present in Denmark since 1979, and up until now, they have been flying a series of direct routes between Northern Europe and several American cities for the cheapest fares on the market. Last summer, a Copenhagen–New-York ticket cost around 3000 crowns (approximately 2 500 Francs). According to certain experts, Northwest Airlines would have given up, the victim of an all-out price war between different private companies, and a shortage of business in the winter in the off season. But above all, it seems that the directors of the company fear possible retaliation against their Copenhagen installations following the sentencing of four terrorists in Stockholm on December 21st.'

(12)  

Britanniques et Allemands de l'Ouest vont tenter, au début de cette semaine, de régler le différend qui les oppose sur le sort du projet d'aviation de combat, dit EFA, concurrent du Rafale français. Un fort courant hostile à ce programme européen apparaîtrait en Allemagne fédérale, pour des raisons à la fois politiques, financières, techniques et industrielles. L'EFA (Eurofighter Aircraft), le chasseur de combat des années quatre-vingt-dix
mis en chantier par un consortium regroupant des constructeurs aéronautiques de RFA (MBB), de Grande-Bretagne (British Aerospace), d’Italie (Aeritalia) et d’Espagne (CASA), est si fortement contesté en Allemagne qu’il risque fort de ne pas voir le jour. En dépit des assurances données par le ministre de la défense ouest-allemand, Mr Gerhard Stoltenberg, qui assure que l’engagement de la Luftwaffe d’acheter deux cents appareils de ce type à partir de 1997 n’était pas remis en cause, il semble que les réticences devant la poursuite de ce projet, dont le coût global est estimé à 100 milliards de deutschmarks (340 milliards de francs), soient en passe de prendre le dessus.

‘The British and West Germans will attempt, at the beginning of this week, to solve the differences that divide them about the fate of the so-called EFA fighter plane, a direct competitor to the French Rafale. A strong, hostile current to this European project is now surfacing in Germany, for political, financial, technical and industrial reasons. The EFA (Eurofighter Aircraft), the fighter for the nineties developed by a consortium of aeronautical firms from Germany (MBB), Great Britain (British Aerospace), Italy (Aeritalia), and Spain (CASA) is so strongly contested in Germany that it may never see daylight. Despite the assurances given by the West German secretary of defense, Mr. Gerhard Stoltenberg, who assures that the Luftwaffe’s commitment to buying two hundred planes of that type starting in 1997 was never questioned, it seems that the reluctance to pursue this project, whose total cost is estimated at 100 billion deutschmarks (340 billion francs) is in the process of taking over.’

The examples that pattern with (11) and (12) are all very similar in structure. They all present a divergence of opinion with respect to a particular situation. The opinion of an expert (underlined in the text) is introduced, but a careful examination of the situation leads the author to a different conclusion. The explicit mention of the relevant sub-part of reality as the subject of sembler to present the author’s conclusion emphasizes her claim that the expert’s position is not based on reality, and thus validates her own opinion. In these examples, the conceptual distance inherent in the construction reflects the divergence of opinion between the expert and the author.

Finally, the una raised construction may also be selected because it best serves the author’s narrative purposes. This is illustrated in (13).

(13) Lundi soir, Flushing Meadow s’était donc préparé à une sorte de veillée funèbre. Et cela commença bien ainsi: Edberg prit d’entrée de jeu le service de Connors et mena 2-0. Mais, à partir de ce moment, tout bascula. Qu’arriva-t-il réellement au Suédois? Avec le laconisme qui lui est coutumier, il s’est contenté de dire qu’il n’était plus parvenu à engager correctement. De fait, il n’a marqué que deux de ses onze jeux de service
Distribution of French Raising Constructions

suivants. C'était pitié de le voir sombrer ainsi à nouveau. Car pareille mésaventure lui était déjà arrivée, en 1985, sur ce même Stadium, contre le même Connors. Quatre ans plus tard et trois titres du grand chelem plus loin, il semblait qu'Edberg ne pourrait plus tomber dans de tels errements. Certes, il avait montré à Paris, contre Michael Chang, puis à Londres, contre Boris Becker, que sa détermination pouvait encore chanceler dans les grandes occasions. Mais, lundi, la panne n'est pas venue que de cela. En fait, rien ne marcha. Qu'il est pu jouer aussi pitoyablement ce soir-là restera sans doute une énigme.

'Monday night, Flushing Meadow had prepared itself for a wake. And indeed, it started that way. Right away, Edberg took Connors’ serve and led 2-0. But from that point on, everything shifted. What really happened to the Swede? With his habitual reserve, he simply said that he didn’t serve well. In truth, he only won two of his next eleven service games. It was a pity to see him drawn again. Because such misfortune already happened to him in 1985, in the same stadium, against the same Connors. Four years later, and three grand slam titles further, it seemed that Edberg could no longer make such mistakes. It is true that in Paris against Michael Chang, then in London against Boris Becker, he had shown that his determination could still flicker in pressure situations. But on Monday, his break down didn’t only come from that. In fact, nothing worked. That he could play so pitifully on that night will certainly remain a mystery.'

The whole passage is about the Swedish player, so Edberg is highly topical. However, its occurrence in the unraised construction serves the overall narrative purpose of the text. The author is comparing the episode he is describing to a similar incident involving the same player four years earlier. His point is that even though Edberg did experience a comparable breakdown before, the circumstances are now so different that this latest episode is totally unexpected. Consequently, his narrative strategy consists in emphasizing the differences in the circumstances, in order to make the similarity of outcomes all the more striking. This is most clearly indicated by the phrase quatre ans plus tard, et trois titres du grand chelem plus loin, ‘four years later and four grand slam titles further’ which sets the episode under mention as far apart as possible from the one that occurred in 1985.

The use of Edberg in the unraised construction partakes of the same strategy. It further increases the distance between the two episodes, because it doesn’t treat the player as a topic, and thus as an element of continuity between 1985 and 1989. Time passing and success mounting created a certain kind of reality, which includes the expectation that the Swedish player is no longer susceptible to unexplainable lapses. The coding of the elements of that reality as the subject of sembler enhances that expectation. The use of the unraised construction allows the author to further increase the conceptual distance between two different representations of the same individual at different times.
4. Conclusion
The main claim of this paper was that the meaning of the French raised and unraised variants of sembler predicts their distribution in discourse. The meaning of the constructions was characterized as the specific profile they impose on a common conceptual base, namely how specific facets of reality reveal themselves to us. The difference between the two structures pertains to which entity of the conceptualized scene has focal prominence. If a participant has particular salience, it will be chosen as the subject of sembler. If no entity of the scene is prominent, the sub-part of reality within which the event or proposition in the complement is located (profiled by il) is chosen as the main subject.

This definition of the constructions was shown to predict their distribution in discourse. Raised NPs were shown to be cognitively available (topical or inferrable) in 75.60% of the cases. Furthermore, in the 12.19% of the cases where sembler’s subject was not available, some local property, namely the structure of the text, the lexical properties of the nominal, or the author’s strategy, was shown to enhance its availability, and thus motivate its use in the raised construction. The initial prediction received similar confirmation from the consideration of the unraised construction. The subordinate subject was found to be neither topical nor inferrable in 51.57% of the cases. Furthermore, in the remaining 47.36% of the cases, the increased conceptual distance between the conceptualizer and her conceptualization characteristic of the construction was shown to be used strategically to indicate a break in the continuity of discourse.

For the raised and unraised constructions alike, the unexpected cases do not challenge the prediction that the constructions’ meanings determine their distribution, because the authors exploit one of their semantic characteristics for strategic purposes. These cases simply remind us that subject selection remains a matter of construal, and that the numbers presented in (4) and (5) merely represent statistical tendencies. The important point is that grammatical constructions provide speakers with tools for conveying specific construals, and their strategic use of these tools is virtually limitless.

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Distribution of French Raising Constructions


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Compensatory Lengthening Without Moras: A Study in Phonologization

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0. Introduction
The term Compensatory Lengthening (CL) refers to a set of phonological phenomena wherein the disappearance of one element of a representation is accompanied by a corresponding lengthening of another element. While both consonants and vowels have been shown to undergo CL, in this paper we are concerned exclusively with CL processes as they affect vowel length.

Lengthening of vowels can result from both consonant deletion, as shown in (1), and vowel deletion, as shown in (2).

(1) s-deletion in Latin (Hayes 1989)
CVC -> CV:

| i:dem  | < *is-dem | 'the same' |
| ka:nus | < *kasnu | 'gray' |
| ko:mis | < *kosmi | 'courteous' |
| fide:lia | < *fidesli | 'pot' |

(2) Old Church Slavic > Pre-Serbo-Croatian (Hock 1986)
CVCV -> CV:C

<table>
<thead>
<tr>
<th>OCS</th>
<th>Pre-SCR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>bobů</td>
<td>bo:b</td>
</tr>
<tr>
<td>bogů</td>
<td>bo:g</td>
</tr>
<tr>
<td>medů</td>
<td>me:d</td>
</tr>
</tbody>
</table>

Though both types of CL are relatively common and have been treated in the phonological literature, our focus here is on the CVCV -> CV:C pattern alone. Thus far in its application appears to involve either a literal transfer of some phonological property of a deleting segment X to a new segmental host Y (Hayes 1989, among others), or alternatively the augmentation of some property of that segment Y in response to,

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1 Profuse thanks are due to Ian Maddieson for his advice and help with statistics. We also thank Andrew Garrett and Alan Timberlake for much patient and illuminating discussion.
or to make up for deletion or shortening of segment X (Timberlake 1983b). While the former approach relies on a notion of preservation and transfer of elements of the phonological representation (moras in the case of Hayes), the latter appeals rather to a more holistic notion of isochrony, or preservation the actual phonetic duration of a word or string.

In this paper we examine the facts of a set of CL phenomena from the history of Slavic. We show that the moraic approach to CL is not sufficient to characterize or explain the development of CL in the languages in question. We propose a new, phonetically-based explanation of the Slavic data. The veracity of this explanation is supported by a phonetic study of vowel duration which we conducted for Modern Russian. This approach, furthermore, can be extended to account for other cases of CL through vowel loss.

1. A Moraic Approach to CL

Perhaps the most influential generative treatment of CL is that devised by proponents of moraic theory (Hayes 1989, Hock 1986, *inter alia*). To capture the appearance of a transfer of vowel length from one place in the string to another (as in 2 above), moraic theorists propose that CL occurs when a mora-bearing segment is deleted, but its mora persists in the representation. This stray mora is then reassocciated to a nearby vowel, making that vowel long, as shown in (3).

(3) Slavic CVCV CL (after Hayes 1989 on Middle English)

\[
\begin{array}{cccc}
\sigma & \sigma \\
\mu & \mu \\
\downarrow & \downarrow \\
b & o & b & \ddot{u} \\
\end{array}
\rightarrow
\begin{array}{cccc}
\sigma & \sigma \\
\mu & \mu \\
\downarrow & \\
b & o & b & \ddot{u} \\
\end{array}
\rightarrow
\begin{array}{cccc}
\sigma \\
\mu & \mu \\
\downarrow & \\
b & o & b \\
\end{array}
\rightarrow
\begin{array}{cccc}
\sigma \\
\mu & \mu \\
\downarrow & \\
b & o & b \\
\end{array}
\]

For Hayes, deletion of the final vowel of the CVCV string results in an ill-formed syllable consisting of a consonant onset and an empty nucleus. Through a process of “parasitic delinking”, the onset consonant is detached from its syllable node. At this point, the stray mora is free to reassocciate to the vowel of the preceding syllable. Note that this approach correctly derives the observed right-to-left directionality of CVCV CL processes. Were the first vowel of the string in (3) to delete, its mora would be incapable of reassocciating to the vowel to the right, blocked, as it were, by the intervening association line of the onset of the following syllable.

Moraic theory thus makes the following prediction: since intervening onset consonants in CVCV CL are not associated to any prosodic structure at the time of the reassocciation of the stray mora, they should have no way of interacting with the application of CL. However, in Late Common Slavic (LCS) dialects, the realization of CV₂VC₁V CL depends crucially on the identity of the intervening CV₂. While some intervening consonants permit CL to take place, others appear to block it. Moraic theory has no way of accounting for this state of affairs.
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2. **Compensatory Lengthening in Late Common Slavic**

   Toward the end of the Common Slavic period, the two lax high vowels known as *jers*² delete in certain positions, giving rise to lengthening of the vowel in the preceding syllable. This CL takes place only if the intervening consonant is above a certain threshold in the hierarchy shown in (5). Different Slavic dialects set this threshold at different points in that hierarchy³ (Timberlake 1983a. and b., 1993).

   (5) \[ \text{sonorants} \geq \text{voiced fricative} \geq \text{voiced stop} \geq \text{voiceless obstruent} \]

      Posavian
      North čakavian
      Czech
      Polish
      South čakavian
      Ukrainian
      Upper Sorbian

   Thus, the Posavian and North čakavian dialects of Serbo-Croatian permit CL only when the consonant intervening between the deleting vowel and the target is a sonorant, as in (6).

   (6) North čakavian: CL only before sonorants
   
      a. *кобь > [koːn] \( \text{\textquoteleft horse\textquoteright} \)
      b. *морь > [mraz] \( \text{\textquoteleft frost\textquoteright} \)

   In Czech, however, CL occurs when the intervening consonant is either a sonorant or a voiced fricative, as in (7).

   (7) Czech: CL before sonorants and voiced fricatives
   
      a. *домь > [duːm] \( \text{\textquoteleft house\textquoteright} \)
      *богь > *боуь > [buːh] \( \text{\textquoteleft god\textquoteright} \)
      b. *родь > [rod] \( \text{\textquoteleft kin\textquoteright} \)

   Polish allows CL across sonorants, voiced fricatives, and voiced stops, as shown in (8).

   (8) Polish: CL before sonorants, voiced fricatives and voiced stops
   
      a. *домь > [doːm] \( \text{\textquoteleft house\textquoteright} \) (Old Polish)
      *добь > [dăːb] \( \text{\textquoteleft oak\textquoteright} \)
      b. *сокь > [sok] \( \text{\textquoteleft juice\textquoteright} \)

   More permissive still are Ukrainian and Upper Sorbian, in which CL takes place regardless of the identity of the intervening consonant.

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² These ultra-short vowels are the reflexes of earlier short /i/ and /u/, and are traditionally represented by the symbols ‘ѣ’ and ‘ѣ’.
³ In fact, accent type, position in the word and identity of the vowel can also play a role in determining the outcome of CL. See Timberlake 1983a. and b. for details. Most importantly, in the majority of dialects showing CL, only mid vowels /e/ and /o/ are targeted for lengthening.
3. A Hypothesis

As noted above, the mora-reassignment account fails to derive the asymmetry of application of CL found in the Slavic dialects, as there is nothing in the representations which could be made to block the reassignment in some cases, while allowing it in others. Manipulation of formal representations thus offers little insight into the problem of CL in Slavic. In what follows, we show that CL is readily explained not through the transfer or insertion of moras or other phonological units, but through phonologization of already existing phonetic duration of target vowels.

It has been widely observed as a universal phonetic tendency that vowels in open syllables are realized cross-linguistically longer than vowels in closed syllables (Maddieson 1985, Rietveld and Frauenfelder 1987, inter alia). Additionally, vowels tend in many languages to be longer before voiced consonants than before voiceless (Hualde 1990 on CL in Friulian, Kluender, Diehl and Wright 1988). These facts by themselves, however, are not enough to explain the range of phenomena detailed above.

Armed solely with the first of the above generalizations concerning vowel durations and syllable structure, we can now approach most examples of CVCC CL in a completely new way. We propose that CL in Slavic does not in fact involve any transfer of length or weight. Rather, phonetic vowel durations found intrinsically in the CVCC environment are reinterpreted as phonologically significant upon the change in syllable structure. Prior to the deletion of the final vowel, the longer vowel duration characteristic of open syllables is correctly parsed by listeners as a phonetic consequence of syllable structure in the first syllable of a CVCC sequence, and is discounted. The vowel is interpreted as phonologically short, as is intended by the speaker. Upon deletion of the final vowel\(^4\), however, the longer duration of the first vowel in the newly-closed syllable becomes inexplicable. The listener therefore parses the longer duration as intended by the speaker, and reinterprets the vowel in question as phonologically long. This view of sound change, wherein intrinsic phonetic properties of the speech signal are misparsed and reinterpreted, yielding phonologization, is proposed and advocated in the works of Ohala (passim), and further developed in Blevins and Garrett 1998 among others.

The above is sufficient to account for the instances of Slavic CL in which intervening consonants play no role, and therefore for most examples of CVCC CL known to us. To account for the interaction of the consonants with CL, though, some additional facts must be invoked. Noting the implicational relationship between consonant sonority\(^5\) and participation in CL processes in Slavic, we hypothesized that vowel durations might be greater not only before voiced obstruents than before voiceless, but that this generalization might represent only the bottom end of a hierarchy of vowel duration differences along a larger scale. Were it the case that vowel duration, at least in LCS (and potentially

\(^4\) Or more likely, simultaneously with the deletion of the final vowel, as it is precisely the listener's failure to perceive the the final vowel which makes reinterpretation of the duration of the initial vowel possible.

\(^5\) Taking "sonority" in its loosest possible sense only as a way of referring to the tendency for certain groups of consonants to behave as classes along a generally-accepted sonority scale (i.e. as in Blevins 1995:211), and not to any specific phonetic features of those classes.
more generally), was longer before consonants toward the left edge of the scale in (5), and shorter before consonants toward the right edge, then the picture we sketch of Slavic CL becomes markedly clear.

To wit, Proto-Slavic had disyllables of the form CVCV, in which the first vowel was phonetically longer before certain segments than before others. With the loss of the second vowel, the language acquired a set of newly-closed syllables. The inherited phonetic duration of the vowel in these yielded in some cases closed syllables with vowels uncharacteristically long for their phonetic environment. This length, previously phonetically conditioned, was now reinterpreted as phonological, producing, in effect CL. Below a certain point in the hierarchy discussed above, however, the aberrant duration was perceptually insignificant and was not phonologized. Different Slavic dialects set this cut-off point for lengthening in different places, resulting in CL before some consonants, and none before others.

4. An Experiment
To demonstrate that the state of affairs we describe for LCS is plausible, it would be desirable to locate a similar set of phonetic facts as yet unphonologized in a living language. To this end, we conducted and experiment with the vowels of Contemporary Standard Russian (CSR), in which we examined vowel durations in closed and open syllables before a variety of consonants.

4.1. Methodology
Subjects were three native speakers of CSR. They were asked to read a list of 78 real Russian words of at least two syllables each. Each word was repeated three times, of which repetitions only the first two were analyzed. Analog recordings were made in a sound booth, and the recordings were digitized and spectrograms and waveforms were produced using CSL. Standard measuring techniques were used to determine vowel durations.

All tokens had stressed vowels /o/ and /a/ in open and closed syllables. Intervening consonants were voiceless stops, voiceless fricatives, voiced stops, voiced fricatives, nasals and liquids. (9) shows some examples of tokens taken from the experiment. To compare the duration of stressed /a/ in open and closed syllables, for example, we used the words papa ‘dad’, and papka ‘folder’.

(9) CVCV
papa
vata
proba
noʃa
sa3a
mama
ʃkola

CVCV
'father'
'cotton wool'
'test'
'load'
'soot'
'mother'
'school'

CVCCV
papka
vatka
lobzik
noʃka
3a3da
mamka
xolka

'folder'
'small wad of cotton wool'
'fretsaw'
'little foot'
'thirst'
'mother' (coll.)
'withers' (equestr.)

---

6 Features of list intonation gave the third repetition of each word both lower amplitude and pitch, and shorter duration, making it less amenable to analysis.
4.2 Results
To interpret the results we obtained, we subjected the mean differences in vowel duration between open and closed syllables to pairwise comparisons for each following consonant. This preliminary statistical analysis using ANOVA tests suggested that further analysis of the data with consonants grouped together into the classes discussed above could be fruitful. Variation between speakers was seen to be insignificant. Note that the crucial measurement for our purposes must be not the durations of the vowels themselves in various preconsonantal environments, but precisely the differences between those durations in closed and open syllables. Vowel durations might well be longer before sonorants than before obstruents, but if they were equally longer in both closed and open syllables, there would be no basis for a reinterpretation to take place upon loss of the vowel in the second syllable.

The table in (10) shows that in comparison of vowel duration differences in open and closed syllables, consonant class is indeed significant. Mean differences in vowel durations between open and closed syllables are greatest for liquids, followed by nasals, voiced stops, voiceless stops, voiceless fricatives, and finally if somewhat mysteriously, voiced fricatives. If we discount for the moment these latter, this corresponds to the hierarchy of consonant interaction found in Slavic CL.

(10) Mean differences between open (O) and closed (C) syllables for both vowels

The results pertaining to the voiced fricatives are unexpected. For these the differences between open and closed syllables were either very small, or even negative for at least one speaker. A possible explanation for this lies in the peculiarities of Russian syllabification patterns. Specifically, because Russian has both voicing assimilation in consonant clusters and word-final devoicing, it is difficult to find uncontroversial examples of voiced fricatives as codas. It is entirely possible, indeed perhaps even likely, that the voiced fricatives in our “closed syllable” examples are in fact syllabified as onsets (no-zdri ‘nostrils’, rather than noz-dri). If this is true, then all the relevant vowel durations were taken from open syllables, and the lack of any appreciable difference in durations is explained.
Compensatory Lengthening Without Moras

Since CL in many dialects of LCS affected only mid vowels, leaving peripheral vowels unlengthened, we compared also the mean differences between the durations of mid vowels before all consonants in closed and open syllables to the mean differences for other vowels in CSR. The table in (11) shows these results.

(11) Mean differences between closed and open syllables for all consonants

![Graph showing mean differences between closed and open syllables for all consonants.]

Curiously, the differences for /a/ are much more dramatic than for /o/ in CSR. If this were also the case in LCS, it is difficult to understand why mid vowel s should often undergo CL, while low vowels resisted it. We propose that the reason for this is to be found in the synchronic facts of the LCS vowel system. In LCS, all high and low vowels are reflexes of earlier distinctively long vowels. All non-peripheral vowels are reflexes of originally short vowels. This is shown schematically in (12).

(12) **Common Slavic** > **Late Common Slavic**

\[
\begin{align*}
\text{ɪ, ĭ, ĭ́, ŭ, ű} & \quad \text{ɪ, ĭ, ŭ} \\
\text{b, b} & \quad \text{ɪ, ŭ} \\
\text{e, o} & \quad \text{æ, ǽ, ø, ǿ} \\
\end{align*}
\]

If at the time of the change peripheral vowels still retained some of their inherited duration, then they were substantially longer at this point than non-peripheral vowels. Thus, even if the difference between the durations of peripheral vowels in open and closed syllables was greater than that difference for non-peripheral vowels, this difference would nonetheless be a smaller proportion of the total duration of those vowels. Simply put, 20 ms is a much less significant chunk of a 200 ms vowel than it is of a 100 ms vowel. It is therefore less likely to be noticed and reinterpreted.
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The table in (13) shows the mean differences in vowel durations in open and closed syllables with the effects of both consonant class and vowel height. While a larger sample might have helped to eliminate a certain amount of statistical noise, one can nevertheless see the same pattern emerging in CSR as there was in LCS.

(13) Mean differences with effects of class and vowel displayed

5. Conclusion
Our experimental results suggest that the phonetic situation we reconstruct for Late Common Slavic is plausible indeed, and provides an explanation for CVCV CL in Slavic. The extent to which the hierarchy we find there represents a cross-linguistic generalization concerning the interaction of syllable structure and consonant class remains to be seen. While the moraic approach sketched above may well be a desirable notational device for the description of synchronic alternations, it not particularly insightful with regard to the origin and typological variation observed for CVCV CL in general, and has nothing at all to say concerning the additional complications found in the Late Common Slavic dialects. Our approach, on the other hand, accounts for the facts of Slavic using only the facts of phonetic vowel duration and syllable structure and requires no additional formal machinery. It is extended with no complication to other cases of CVCV CL, such as, for example, Friulian. For all their usefulness elsewhere, this study renders the formal notion of the mora irrelevant to the explanation of CL and adds another case to the list of sound changes which are better understood in terms of the reinterpretation of intrinsic phonetic properties, rather than through the manipulation of phonological representations.
Compensatory Lengthening Without Moras

References


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Probability in phonological generalizations:
modeling French optional final consonants

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0.  The problem of conflicting phonological generalizations∗

The place for statistics is outside, not inside, grammar. (Smith 1997:298)

it is important … not to mistake complexity for irrelevancy. (Abney 1997:13)

The starting point for this paper is the simple and unoriginal observation that
many phonological generalizations are variable. By variable, I mean that their
application is not predictable from phonological properties of the string, but rather
depends probabilistically on other factors. In speech perception, phonological
generalizations are particularly variable because of dialectal and inter-speaker
differences; perception is the perspective taken in this paper.

Four types of variable phonological generalizations are identified in section 1.
I outline several existing partial solutions to these types in section 2, from the
generative phonology and variable rules traditions. These solutions cannot
account for all types of variation, though, and I argue in section 3 that one type
they have particular problems with, interacting extraphonological variation, is
qualitatively indistinguishable from the others.

Section 4 proposes a solution which takes advantage of a knowledge
representation model recently developed in Artificial Intelligence known as Belief
Networks (BNs–Jensen 1996). Section 5 demonstrates that BNs not only meet
descriptive adequacy for interacting extraphonological variation but also that they
surpass variable and generative models in learnability and neural plausibility.

1.  The variable generalization problem

1.1  Types of variability

Despite what one might gather from a survey of introductory phonology
textbooks, phonological generalizations are not all simple and invariant. And yet
it is possible to detect traces of variation in the generative phonological literature,
where four types of variation phenomena can be distinguished.

Type 1.  Free (Type 1) variation is occasionally mentioned, but infrequently
accorded any import. At least, this was the case before Optimality Theory

∗Many thanks to Mark Paskin, Nancy Chang, Emily Bender, and Michael Israel for their insightful
comments. Any errors or oversights are due exclusively to me.
(OT–Prince & Smolensky 1993) took the phonological stage. To the extent that any variation is truly free of social correlates, it can be dealt with much more parsimoniously in OT than in previous generative models, and very interesting quantitative work has been done in this direction (e.g. Antilla 1997).

**Type 2. Predictable** phonological (Type 2) variation is much more commonly discussed in the generative literature because it is thought to be rule-governed. Type 2 variation can be defined as the variable application of a phonological generalization when certain other phonological generalizations are present. A central example of this type of variation is phonological *opacity* (Kiparsky 1973).

**Type 3.** Not all non-phonological variation (perhaps none of it) is truly free. Rather, certain variable phonological generalizations, like the deletion of a word-final *t* or *d* in English, correlate with social factors. Research on Variable Rules (VRs), which started in the late 1960s (Labov 1966) and has continued into the present (c.f. Fasold 1996 for an overview) stems from this very observation.

Sudents of sociolinguistic variability have closely inspected *independent* (Type 3) variable generalizations. An example of this class is the case of French optional final consonants (Verluyten & Hendrickx 1987, Stammerjohann 1976). These are a class of about 50 words whose final consonants can be pronounced or elided, depending on social and phonological environment; they include *août* ‘August’, *cinq* ‘five’, *fait* ‘fact’, *but* ‘goal’, and *ananas* ‘pineapple’. The most significant conditioning factors for the rule are properties of the following segment and the speaker’s age, gender, nationality and social class (1).

| (1) Sociolinguistic variables & French optional Cs (Verluyten & Hendrickx 1987) |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Age                               | Nationality                      | Gender                           | Social Class                     |
| Young                             | Old                               | French                           | Belg.                            | *F* | *M* | Low | High |
| % produced                        | 65                                | 52                               | 72                               | 47  | 61  | 57  | 65   | 52   |

None of these conditioning factors determines whether the final consonant will appear in any strong sense. Instead, particular values for each variable increase the statistical likelihood that the consonant will occur. For example, the categorization of the segment following the optional final consonant can affect these values: optional final consonants are missing before consonants with a 64.8% probability, and before vowels at 48.8%. Moreover, these constraints do not interact; the contribution of each can be assessed independent of the values of any of the others. This distinguishes **Type 3** (independent) variability from **Type 4** (interacting) variability.

**Type 4. Interacting** (Type 4) variation is nicely exemplified by the problem of word length and grammatical class in French liaison (Tranel 1981). French liaison consonants are a class of word-final consonants that can be pronounced or not, depending again on a set of factors. These factors belong to various domains: surface phonological (e.g. properties of other realized segments), syntactic (e.g. constituency and grammatical class), morphological (e.g. expressive/semantic status), social and sociolinguistic (e.g. register, style, speech rate, and dialect), and others. Again, they contribute non-deterministically to the string’s realization.

Crucially, two of these factors interact: word length and grammatical class. In
other words, shorter liaison words make the expression of a liaison consonant more likely, but only if those words are prepositions or modifying adjectives, and not nouns or non-modifying adjectives (de Jong 1989). Thus we say that these two effects are not independent, but rather interacting. The theoretical ramifications are addressed in section 3, but in sum, existing generative models and variable rule analysis cannot deal with generalizations of this type.

1.2. Evidence for variability
One explanation for the poverty of discussion of variation in the mainstream phonological literature is that it calls for a particular methodology that is not the norm. Variation benefits from corpus studies in a way that invariance does not for three main reasons. First, since correlates of a variable phonological generalization can be of various types, the set of possible contributing factors can become too large to be elicited or introspected in a reasonable time. Second, the very fact that the generalizations are not deterministic means that a large number of tokens need to be studied for results to be statistically significant. Finally, some variability is closely tied to extralinguistic attributes of the speaker, in which case a single speaker is not a representative source of evidence.

A second explanation is the belief in a fundamental schism among the four types of variability discussed above. Where exactly to draw that line is unclear, but opacity (Type 2) has been widely addressed by mainstream phonological models, while interacting extraphonological variation (Type 4) has not. In contrast, two arguments can be made for treating all four variation types uniformly.

First, the kind of evidence that a language-perceiver or analyst can collect for all types is qualitatively similar. All cases are characterized by measurably different phonological forms with identical or related denotations, where phonological generalizations about the distribution of those forms cannot be made on the basis of their surface co-occurrences. The types differ in whether the probabilities of the generalizations correlate with factors outside the string, and whether contributing factors interact. Opacity, e.g., can be seen as interaction between morphological and phonological generalizations.

The other argument for treating variability in a unified manner is that no clean line can be drawn between a purely phonological or purely grammatical variability on the one hand and extraphonological or extragrammatical variability on the other. Rather, different contributing factors from different modes interact. For example, properties of the following segment interact with lexically-specified final-consonant probabilities in French liaison (Bergen ms).

A final explanation for the absence of invariability in phonological studies is the a priori belief that phonological systems are inherently deterministic. The next section explores the ramifications and limitations of this notion, as well as the Variable Rule model, which is a step in the direction of representing uncertainty.

2. Dealing with variable generalization
Most phonological models are characterized by an underlying assumption, the invariance hypothesis, which holds that the elements of phonological generalizations are invariant. In particular, invariance is presupposed for the
object of a generalization, its environment, and its content. As Labov (1997)
notes, the principle aim of linguists seems to be the reconstruction of theoretical
invariance on the basis of variable data. Historically and methodologically, it is
precisely the failure of this procedure that leads to the study of variability. But
how is an invariant model to deal with statistically-variable data?

The study of Type 1 (free) variable generalizations is still in its infancy in
invariant generative phonology. While rule-ordering approaches have essentially
nothing to say about free variation, several different means have recently been
proposed for making precise distribution predictions using OT. These include the
invention of probabilistic ranking (Boersma & Hayes ms), relative unranking
(Anttila 1997), and floating of constraints (Nagy & Reynolds 1997).

Type 2 (predictable) phonological generalizations do not hold in a surface-true
manner, but due to regular historical developments—and sometimes also to
synchronic factors—they do display certain regularities. These regularities are
integrated into invariant models where rules can be intrinsically ordered (Kiparsky
1973), where constraints “gang up” (Kirchner 1996) or where forms can be
selected by the analyst to win on grounds of “sympathy” (McCarthy 1997).

However, Type 3 (extraphonological independent) variability seems to be best
addressed by Variable Rules (VRs). VR analysis (Labov 1966) treats socially-
correlated variation with the very simple but theoretically significant addition of
quantitative weightings to SPE-style generative rules. The most discussed
example of this type of analysis treats the problem of English word-final t/d
deletion (e.g. Guy 1991). The application of t/d deletion, although apparently
active to some extent in all dialects of English, has been found to correlate with
certain social attributes of the speaker, such as age, social class, and gender.
Linguistic environments favoring the application of this rule are two preceding
consonants, an unstressed final syllable, and a following sonorous segment, i.e.

VRs take the following form, where angled brackets designate variable
contexts, those that affect the application of the rule probabilistically given a
socially-determined input probability, and square brackets are invariant (2). VRs
like this one are derived from the statistical evaluation of the probabilistic
contribution of a set of independent factors to the application of the rule.

(2) t, d → <∅> / <-stress> <+cons> [+cons] _ <+son>

Neither generative nor variable models is able to address Type 4 (interacting)
variability. The next section describes failings of each model in accounting for
variability.

3. Problems with existing models

The best-known critiques of derivational models are psychological and neural
plausibility arguments (c.f. the papers in Goldsmith 1993 or Lima et al 1994). One
of the most convincing is a processing limit argument. Adapting Price’s (1996)
demonstration, let us imagine a truly serial perceptual (or production) system, in
which each of six modules makes its calculations, then passes its results to the
subsequent module. (For argument’s sake, these might be phonetic, phonological,
morphological, syntactic, semantic, and pragmatic levels.) Given that no module
can ever be 100% certain of its assessments (due to variability ranging from the phonetic to the semantic realms), an ideal system might display 95% accuracy per module. But giving these nearly perfect calculations, we could only be confident about the product of our elaborate derivation to an accuracy of only 73%. In vivo production and recognition systems work worlds better than this.

Strong seriality therefore calls into question the plausibility of VRs and certain generative models, independent of problems they display with variability.

3.1. Invariant models
The invariance itself of invariant phonological models poses problems when it comes to learning. How can an invariant representation be constructed on the basis of variable input? The simplest, and perhaps the most theoretically-charged, answer is to posit innate and/or universal pre-phonological generalizations (read: parameters or constraints). Hoping not to get sidetracked by the innateness question, I would simply like to point out that “learning systems” based on innateness are not accounts of the learning of invariant structures from variable input, but rather accounts of the reorganization of invariant generalizations on the basis of variable input (e.g. Tesar & Smolensky 1996, Boersma & Hayes ms). Moreover, innateness is not the only solution; there exist psychologically-plausible accounts of concept formation that depend on exclusively variable inputs, such as prototype (Rosch 1978) and exemplar models (Johnson 1997). To the extent that learning of variable concepts is possible, arguments for innateness on the basis of the poverty of the stimulus are unjustified, as thus so are models based upon the reorganization of invariant, innate constraints.

Moreover, the extension of invariant models to account for socially-correlated variation (Types 3 and 4) may violate their basic tenets. The circular reasoning might go something like this: Grammar is different from usage-based linguistic knowledge in part in that it is invariant and algebraic; it is a separate module that does not interact with extralinguistic knowledge; social factors cannot enter into a model of grammar because they introduce uncertainty and language-external constraints (“There is no motivation for tying variation to rules of grammar” (Fasold 1996:91)).

3.2. Variable Rules (VRs)
Certain long-standing critiques of VRs have enjoyed wide success, and VRs have become somewhat hard to come by, as summed up nicely by the title of Fasold’s (1996) paper, “The quiet demise of variable rules”. Attacks have focused on both empirical and theoretical commitments. First, I cite some empirical claims about language for which VRs have been criticized:

- **They are unable to account for the statistically interacting properties of social contexts and deny this property for linguistic context.** This aspect is problematic since social and linguistic factors display interacting properties (de Jong 1989).
- **They claim different languages or varieties stand on a continuum.** On the contrary, language users often recognize clear-cut boundaries between speech communities.
• They presuppose variables in VRs to have no effect on meaning. The semantics of the utterance must not be affected by a choice of alternate.
• They disallow conscious manipulation of linguistic variable, as with speech style (Dittmar 1996). Social meaning is restricted to phonological and morphological variation. This entails that speakers cannot make linguistic choices to convey social meaning.

Variable rules have also been attacked for theoretical properties:

• Their phonological representations inherit SPE’s flat structure. Hierarchical organization of phonological structures was one of the most significant advances of recent phonological theory (Goldsmith 1990). VRs have not been extended to hierarchical phonology, probably because of the enormous structural and computational problems of such a move.
• Their quantitative values are essentially arbitrary, i.e. non-explanatory, except that they do predict relative ranking of environments (but see Guy’s (1991) claim to contrary, which appears to suggest ratios on the basis of a lexical phonology approach).¹
• They don’t actually integrate probabilities with a grammar. VRs provide interface points, but the probabilistic mechanisms that would have to be posited to deal with variation are absent.
• They can cover up categorical behavior by individuals or subgroups. Bickerton (1971) observed that statistical generalization can lead to the belief that individual behavior is identical to group behavior.

Both VR and invariant models are problematic in general, and are unable deal with uncertainty of various types, in particular, Type 4 variability.

4. Fighting uncertainty with uncertainty
I propose an alternative solution to the variable surface generalization problem which does not make use of problematic ranking or ordering and additionally allows the complex combination of multiple modes of probabilistically interacting information. The proposed solution posits that phonological knowledge itself is not invariant but rather probabilistic. Type 1 (free) variation is dealt with by assigning a prior probability to the variable phonological generalization. Type 2 (predictable) variation involves the near-categorical, but nonetheless probabilistic, contribution of phonological and morphological factors. Type 3 (independent) variation involves the probabilistic assessment of external (and phonological) factors. Type 4 (interacting) variation is treated with interacting probabilistic external and phonological factors. A single, probabilistic mechanism can serve to unify these types of knowledge.

¹ The same critique could be leveled at generative grammar in general. Differences in language-specific constraint rankings are entirely non-explanatory, even if they can be harnessed to give specific quantitative predictions about realization (as in Anttila 1997).
4.1. Support for probability in cognition
The proposal that phonological knowledge is fundamentally probabilistic finds independent support in both general cognitive processing properties and specific aspects of "creative" language use.

Schematic conceptual knowledge (that is, abstraction over specific perceptual instances) is probabilistic rather than invariant. Several lines of fruitful research dedicated to understanding conceptual representations have formulated this observation in differing terms: fuzziness, prototype effects, and gradedness in categories (Lakoff 1987), but the substance of the models is similar. We can thus expect phonological abstractions to be probabilistic as well.

Second, "creative" uses of language (the production or recognition of novel forms) and historical developments (Bybee and Slobin 1982) display probabilities in the same way as "uncreative" language does. By the same token, linguistic judgements (a sort of "creative" linguistic endeavor) are similarly subject to probabilistic assessments (Hayes ms, Bender 2000). Along with the probabilistic nature of corpus data, this suggests that empirical evidence for creative language use is in essence probabilistic.

A model which aims to extract multi-leveled probabilistic information from the phonological signal, and also to adapt its production according to multi-modal factors impacting phonology, must encode this knowledge. Until recently, however, the computational demands of this problem were too great. Belief Networks are shown in the next section to be appropriate for modeling phonological generalizations, specifically for the set of interactions responsible for the optional final consonant phenomena described in section 1.1 above.

4.2. Belief Networks (BNs)
Belief Networks (BNs) are a concise and powerful computational representation of uncertain propositional knowledge (Jensen 1996). Specifically, BNs consist of (1) a set of nodes representing propositions or variables, each of which has (2) a set of possible values, (3) links between causally-related propositions (where causation can be interpreted either ontologically or epistemically), and (4) conditional distributions, specifying the probability of each value of every node given a value assignment to its parents. Using a probability theory, inferences can be made about the probability of the value of any node given any (set of) observed values for any other nodes. Another appealing property of BNs for many large-scale problems like the present one is that given certain independence assumptions, the set of conditional distributions is much more succinct than a complete joint distribution for all the variables of the system.

In a simple example, five propositions, each with multiple possible values, are represented by nodes (circles) in (3). The node representing the proposition Rain(t,f) stands in a causal relation to Lawn_Wet(t,f), as indicated by the link connecting the two. Causality is indicated by the unidirectionality of the link; Rain(t) causes Wet_Lawn(t), and not the reverse. Each node is associated with a conditional distribution table. Orphan nodes, those with no parents like Rain(t,f) and Sprinkler(t,f), have simple prior distributions that express solely the probability of each of their values. In the example in (3), there is a 0.3 likelihood
that Rain will take the value true, and a 0.5 chance that Sprinkler will be true. The sum probability for all the values of a proposition is always 1.

The relationship between two causally-linked propositions is encoded in the conditional distribution of the downstream node. Lawn_Wet, for example, has two parents, and since each of them has two possible values, the probability of each of its two values is specified for the four \(2^2\) possible causal states, thus giving eight \(2^3\) possible configurations. If we know Rain to be true, and Sprinkler to be false, then the probability of Lawn_Wet(t) in this example is 0.95, while if Rain is false and Sprinkler is true, then Lawn_Wet(f) has a 0.1 probability.

(3) Simple Belief Network

But the real interest of BNs lies not just in their representational power but more importantly in their inferential power. First, given a network and full set of conditional distribution tables as in (3), beliefs about the various propositions are propagated to produce the unconditional probability of each proposition, the prior probabilities of its values given the network. Alternatively, inference can be made given observations about the values of propositions. The second sort of inference, diagnostic inference, involves the propagation of evidence from an observed effect (a child) to an unobserved cause (a parent). For example, given that we observe Paw_Prints to be true, we might ask what the probability is of Rain or Lawn_Wet being true. Third, causal inference involves the prediction of effects given that values for causes are observed. In the case of (3), we might observe Sprinkler to be false and then let the inference algorithm determine the probability of Paper_Wet also being false. Finally, hybrid types of inference are possible: for example, what is the probability of Lawn_Wet being true if Rain and Paw_Prints are both true?

4.3. A Belief Net model for optional consonants
Assuming for the purpose of exposition that the only factors contributing to the
occurrence of a final consonant in French are the ones enumerated in (1) plus the nature of the first segment of the following word, the BN in (4) can be constructed. Each node represents a variable, and Gender, Class, Age, Nationality, and Following_V are assumed to have only two possible values each to keep the network simple, although continuous values are also allowed in BNs. By the same token, the lexicon is compressed into only three words, each of which represents a word class; ananas ‘pineapple’ has a frequently omitted final consonant, the final consonant of cinq ‘five’ is rarely deleted, and the final consonant of coq ‘rooster’ is always pronounced. Since there are no interactions between individual social factors and any other factors, their influence is summarized under Soc_Factors, which is what is known as a hidden node. That is, evidence for the values of this node cannot be directly extracted from the environment itself, but rather must be inferred.

(4) Belief Network for optional consonants

In the network in 4, given the probabilities of co-occurrence of variables taken from Verluyten and Hendrickx (1987), we can perform inference tests. First, let us consider the unconditional (prior) probabilities for each of the nodes, in (5a). Word(coq) is significantly more likely than its lexical competitors, since the non-optimal class it stands for is the most common in the language. Final_C(t) is significantly positive as a consequence of this; all other nodes are at chance. Next, we can assess probabilities given observed values for a subset of the nodes. Given, for example, Word(ananas), that is, given that the word considered is ananas, the probabilities of all visible nodes are 0.5 for each state, except for FinalC, whose probability of true is 0.67 (5b – note that observed values are designated by bold italic). For Word(ananas) and Following_V(f), the only difference is that, as expected, the probability of FinalC(t) rises to 0.73 (5c). To test the significance of FollV, (5d) shows the results of Word(ananas) and FollV(t). The result of setting all the social factors plus Following_V to the values most conducive to suppressing a final consonant is shown in (5e), while the reverse is shown in (5f).
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<th></th>
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<th>Cinq</th>
<th>Coq</th>
<th>T</th>
<th>F</th>
<th>FinalC</th>
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<th>Age</th>
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Perceptual conclusions can be drawn through inference from an observed input. For example, given that the word *ananas* was identified and produced with or without a final -s, the values for all other variables are assessed to be as shown in (5g) and (5h), respectively.

The use of a model like the one described above for speech recognition should be clear; if values for these propositions can be extracted from speech input, they can help to predict future linguistic behavior for disambiguation. BN models constitute dynamic models in this respect. Additionally, in this model, interacting constraints (Type 4) are encoded just like independent constraints: the conditional distribution tables identify the contribution of each parent given each value of every other parent. Other properties of the model are discussed below.

5. **Properties of this model**

The probabilities of the interactions between generalizations can be easily learned in a Bayesian model from surface-true generalizations. Moreover, this computational mechanism displays neural properties, making it cleanly groundable in a biologically plausible model.

Learning the conditional probabilities of a BN involves the relatively simple statistical extraction of distributions of co-occurrent proposition states from evidence. However, structure induction, the construction of a network (and its architecture) from data, is harder. Several methods exist for coercing the right kinds of structure to emerge, and I will only name some here: entropy methods, score metrics, simulated annealing, and genetic algorithms (Jordan 1998).

Not only are BNs learnable from variable data, but they display properties that make them particularly neurally plausible. First, all of a node’s information is stored locally: everything a node needs to compute the effects of events elsewhere in the network is available in the node representation itself. Neurons behave in exactly this way. Inference in BNs is performed through the propagation of beliefs from one node to another, in way similar to the propagation of activation in neural systems. Finally, the result of inference in a BN is a probabilistic result, which is analogous to the graded output of a neuron or batch of neurons responding to an input over time.

In recent work, Wendelken and Shastri (ms) have made great strides towards a theory of BN inference at the structured connectionist level (Feldman 1988). They
demonstrate that a class of BNs to which the ones presented above belong can be reduced to structured connectionist systems with very interesting properties: conditional probabilities can be represented as link weights, node states as activation states, and inference propagation as spreading activation. Moreover, they have found that learning can be done in a Hebbian manner in such systems. Hebbian learning is responsible for associative learning – it is the strengthening of connections that fire together. In other words, BNs can be learned at the neural level by the simplest (and oldest) known form of associative neural reorganization.

6. Conclusion
The argument presented above would benefit from advances on two fronts. First, the demonstration that phonology-internal and phonology-external constraints interact probabilistically is presented elsewhere (Bergen ms). Second, the model must be extended to deal with Type 2 (predictable) variation. Such a model, following along the same lines as the work presented here, would involve knowledge of variation in forms that are morphologically-related to a given variable form helping a language user predict properties. In other words, knowing that a form has a certain disposition relative to a variable generalization can allow a language learner (and for the same reason a language user) to predict behavior of morphologically-related forms relative to other variable generalizations.

I have tried to argue the position that variation of linguistic generalizations compels us to integrate probability into phonological models, a position in significant accord with usage-based models of phonology, as proposed by Bybee (1999) and Kemmer and Israel (1994). The twentieth century was marked by the introduction of probabilistic notions of causation into physics, allowing some of the greatest technological advances of our time. There is no reason to think that the twenty-first century will not see the same intellectual explosion in language science, as long as we allow ourselves the privilege of thinking probabilistically.

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The Need for the Resultative Network

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0. Introduction\textsuperscript{1}
In this paper I will argue that in English there are various resultative constructions and that such constructions can be given a network description in the sense of Cognitive Grammar (Langacker 1987, 1991)\textsuperscript{2}. First, I will discuss the ‘traditional’ definition of resultative phrase (cf. Levin 1993) and I will show that such a definition is unsatisfactory. Consequently, I will propose a new definition of resultative construction which implies the existence of a resultative network. In the last part of my paper, I will discuss the resultative network in more detail by focussing on its two main variants, the Force Change Schema and the Event Change Schema.

1. What is a resultative phrase?
The term resultative phrase usually refers to “an XP which describes the state achieved by the referent of the noun phrase it is predicated of as a result of the action named by the verb” (Levin 1993: 101). A resultative construction (RC) is the construction in which the XP and the related verb appear (e.g. John hammered the metal flat). It is argued (Levin and Rappaport Hovav 1995, among others) that XP can be predicated only of direct objects (the so-called ‘direct object restriction’ (DOR for short)), as shown in (1) (from Levin 1993):

(1) *Polly cooked the cookies dirty. (intended meaning: Polly became dirty by cooking the cookies)

Sentences like (2)

(2) The river froze solid.

\textsuperscript{1} I would like to thank Gabriele Azzaro, Chiara Frigeni, Wilhelm Geuder, Ian Harvey, Ingrid Kaufmann, and Geoffrey Leech for their help.
\textsuperscript{2} In what follows, I will assume some familiarity on the part of the reader with the basic tenets of Cognitive Grammar.
are not counterexamples to the DOR, although the adjective *solid* is predicated of
the subject (*the river*), because, within generative approaches, the subject of
unaccusative verbs like *freeze* is treated as an underlying object and, within
semantically-oriented accounts, ‘object’ corresponds to the proto-role ‘patient’
(see Van Valin 1990, Goldberg 1995), as is the case of *the river* in (2).

In what follows, I will try to show that linguistic data are much more complex
than the (causal) definition of resultative phrase and the DOR imply and,
consequently, that we need to introduce the notion of ‘resultative network’ in
order to appreciate the interrelatedness of various linguistic phenomena. In other
words, there exists a host of constructions that may be called ‘resultative’
(although this term will be used in a more general fashion than above) and such
constructions can be given a network description.

2. Some problems

2.1. States and positions

Levin’s definition excludes changes of position. Cross-linguistically, however,
there seems to exist a correlation (see Slobin 1996) between directed uses of
motion (and, perhaps, sound emission) verbs (which take positional PPs) and the
availability of RCs. Indeed, some analysts regard RCs as a metaphorical extension
of directed uses of motion verbs (cf. Goldberg 1995), while others don’t
distinguish between the two (cf. Tortora 1998). It can also be shown (Broccias
2000) that the constraints both the (transitive variants of the) RC and the directed
uses of motion verbs are subject to (see Goldberg 1995) are similar, in that they
evoke a force dynamics scenario (in the sense of Langacker 1991). Further,
the distinction between ‘state’ and ‘position’ is sometimes a matter of degree. The
PPs in (3) denote spatial configurations that do not describe actual spatial
positions but must be interpreted metaphorically as states (‘I was angry’ in (3a)
and ‘The soles were worn out’ in (3b)).

(3) a. He drove me up the wall.
   b. We ran the soles off our shoes.

2.2. Non-causal resultant states

Levin’s definition implies the existence of a causal relation between the action
denoted by the verb and the state expressed by the XP. Causality prevents a
sentence like (4) from being categorized as an RC, despite the fact that the
adjective describes a state (that of the door being shut) and that *shut* can appear in
other ‘true’ (i.e. causal) RCs, as in (5).

(4) The door hissed shut.
(5) He pushed the door shut.

Analogously, (6) shouldn’t be categorized as an RC because no causal relation
exists between the event expressed by the verb and the PP.

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(6) She drank vodka well into her twilight years.

We note however that (6) contains a motion preposition (into), as is the case with other RCs, has some kind of resultative meaning (the PP denotes an endpoint, corresponding to the subject’s referent being in her twilight years) and its existence is compatible with the schemas postulated within the resultative network (see below). Interestingly, the PP in (6) is also subject-oriented (i.e., it is predicated of the subject). This leads us to the problem addressed in the next section.

2.3. Subject-orientation
As has been observed by Verspoor (1997), some RCs (in the sense of Levin 1993) contain subject-oriented XPs, thus violating the DOR. We can distinguish three cases.

Some examples show a lack of a (unidirectional) energy flow from subject to object (in the sense of Langacker 1991), as in (7) ((7a) from Verspoor 1997).

(7) a. I love you to distraction.
   b. I’ll fight (it) to the death.

In (7a) there is no (necessary) energy flow because the object may be unaffected by the subject’s feelings (i.e., the object may be unaware of them). In (7b), fighting involves an energy flow from subject to object, but also one from object to subject: the object is in some way responsible for the death of the subject3.

A second group of examples involves verbs (of impact) that do imply a unidirectional energy flow from subject to object but also contain a PP whose complement stands in a (more or less literal) body-part relation with the constructional object, as in (8):

(8) a. The sea air slapped me in the face.
   b. It touched/shocked us to the core.
   c. It cut me to the heart.

The last group of examples (see (9), from Verspoor 1997) concerns those cases in which verbs of movement (or construable as such, like play in (9d)) take both a nonmanipulable object and a PP which, adopting Langacker’s terminology, realizes a salient part of the verb’s base.

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3 Interestingly, subject-orientation seems to obtain with the PP to the death, whereas the PP to death is usually object-oriented.
(9) a. We followed the star out of Bethlehem.
b. The sailors rode a breeze clear of the rocks.
c. John danced mazurkas across the room.
d. The children played leapfrog across the park.

Before concluding this section, I would like to cite two other examples, (10) and (11), which I will not discuss further for reasons of space but which provide additional evidence for the complexity of the notion of RC.

(10) She rode the horse to town.
(11) a. I gave him a hand outside (i.e., to go outside).
b. His window was thrown wide to the sun.

(10) shows that in some cases a PP can be predicated of both the subject and the object: both the subject’s and the object’s referent can be said to be in town once the action denoted by the verb is over. (11a) demonstrates that an RC can contain two objects (him and a hand) and (11b) shows that two resultative phrases (wide and to the sun) can sometimes cooccur (see also Goldberg 1991).

2.4. Interim conclusions
The examples discussed so far have shown that the notion of RC is much more complex than is usually assumed. Some constructions can be considered resultative and yet they lack a causal relation between the verb and the final state/position expressed by the XP. Other examples indicate that subject orientation does occur, contrary to what is implied by the DOR. I will argue that a neater picture emerges if we introduce the notion of ‘resultative network’.

3. The resultative network
3.1. A revised (non-causal) definition
In order to capture the similarities among the examples discussed in the previous section, we could interpret the term ‘resultative phrase’ in a more general fashion as referring to either a state or position achieved by an entity a involved in some event E, provided that a is spelled out as a constructional argument. This definition neither requires the existence of a causal relation between the constructional verb and the XP, thus allowing for the ‘problematic’ cases discussed in 2.2, nor makes any categorial distinction between states and positions (versus Goldberg 1995). All the constructions that satisfy this definition can be said to make up a ‘resultative network’, in the sense that (a) we can group some of them together as realizations of a particular schema because of their common features and (b) such groups are related to one another.

3.2. A sublexical definition
It should be stressed that even the revised definition of the term ‘resultative’ proposed in 3.1. does not encompass all possible resultative cases. In fact, it
The Need for the Resultative Network

explicitly requires the resultative phrase to be predicated of a phonologically realized argument. However, there are some cases that resemble resultative constructions and yet do not satisfy the above definition. Consider (12):

(12) a. The man was sobbing into his hands.
    b. She shouted up into the trees.
    c. He fired a machine gun into the supermarket.

They all contain verbs that can be described as 'verbs of emission'. With such verbs the PP could be said to refer to the verbal event (see O’Dowd 1998:112). For example, it is the sobbing in (12a) that goes into the pillow, not the subject’s referent. But we also note that a verb like shout allows the addition of a direct object (one can shout something up into the trees) of which, then, the PP can be taken to be predicated. Consequently, the other examples in (12) could be treated in a similar fashion by postulating the existence of a ‘null’ object of which the PP is predicated. However, (12c) shows that such a move is sometimes untenable; the PP in (12c) clearly refers to the firing event, not to the gun. In my view the two alternatives (predication over events vs. predication over objects) amount to different paraphrases of the same semantic representations, which are given in (13):

(13) a. see (12a-b)  b. see (12c)

```
  the man  into his hands  he  gun  into the supermarket
      |     |                        |
 was sobbing                                    fired
```

The schema in (13a) is relevant for the examples (12a–b), the one in (13b) for (12c). A verb of emission is represented through a series of small circles—they represent what is emitted (e.g. a series of sounds)—originating from an entity (the trajector, the leftmost circle). The constructions in (12) also specify a telic path, which has been represented in (13) as the arrow connecting the smaller circles plus the square box towards which the small circles move. (13a) captures the intuition that the resultative phrase seems to refer to a null object (i.e., the emitted substance) and the fact that what is emitted is produced by the subject. The schema in (13b) shows the semantic pole of (12c). The verb lexicalizes both the force (the double arrow) exerted by the subject (the leftmost circle) onto the object (the big circle on the right, corresponding to the gun in (12c)) and what is emitted by the gun (the smaller circles). In analogy with (13a), it is the emitted substance that moves towards the location represented as the square box. This explains why the PP in (12c) is not object-oriented.
If we regard the examples in (12) as ‘resultatives’, we should then interpret this term as also referring to sublexical entities (i.e. entities whose existence can be postulated at the semantic pole but which are not realized independently of the verb at the phonological pole):

(14) definition of resultative phrase
A phrase is said to be resultative if it refers to a state or position achieved by an entity \( a \) involved in an event \( E \), provided that \( a \) can be postulated at the semantic pole of the relevant construction.

3.3. The Force Change Schema and the Event Change Schema
In what follows I will concentrate on that portion of the resultative network that is relevant for the cases where the resultative phrase refers to a lexical entity.

I propose that within the resultative network we recognize two fundamental schemas, the Force Change Schema (FCS) and the Event Change Schema (ECS), represented in (15a) and (15b), respectively.

(15) a. FCS

\[
\text{they laughed me off the podium} \\
\text{force component} \\
M \rightarrow m \\
\text{the mansion} \\
\text{change component} \\
\text{event component} \\
\text{burned down} \\
\text{M=Manipulator, m=manipulee, TH=theme, P=path, tr=trajectory, E=event}
\]

The semantic pole of the FCS describes a forcible interaction (see the force component in (15a)) between a manipulator \( M \) and a manipulee \( m \), resulting in the change of state or position of the latter (see the change component in (15b)). In more detail, the force component (F or F component, for short) comprises an \( M \) which exerts a force (represented by the arrow) onto an \( m \), the dotted circle. The change component (C or C component, for short) contains an entity, which I will refer to as theme \( (TH \) for short), which moves literally or metaphorically (i.e. it is subject to a change of state/position), as indicated by the arrow \( P \) (path), towards a location (whether literal or metaphorical), represented as a square. The construction requires the identity of both \( m \) and \( TH \) as indicated by the dotted line connecting the two. The \( m \) circle is dotted to signify that the entity acted upon is not necessarily selected by the constructional verb (as in *They laughed him off the podium*). The integration of F and C results in the structure depicted as the upper
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box; it shows that $M$ is responsible for the change of state/position of $m$. The phonological pole of the FCS (not represented in (15)) requires the C component to be expressed by an XP. XP can correspond to an AP, as in She shot him dead, a PP, as in He rocked her to sleep, an NP, as in They appointed him president, or a combination of them, as in (11b).

The FCS expresses the commonality of those cases which are usually called resultative, that is those cases which display both a causality link between the verb and the resultant state (see 2.2.) and object orientation (cf. the DOR).

Let us now examine the ECS (see (15b)). The ECS also results from the integration of two components, namely the event component (E or E component, for short) and the change component, identical to the one within the FCS. The former shows an entity, a trajector ($tr$), as being involved in an event E. The E component and the C component are integrated into each other by imposing the identity of $tr$ and $TH$, as indicated by the dotted line connecting the two. We obtain a complex event, represented as the upper box in (15b), which specifies that the E component and the C component are projected onto each other, as will be explained below.

The ECS is relevant, among other things, for ‘traditional’ intransitive resultatives, such as The river froze solid, as shown in (15b).

Before illustrating the ECS in more detail, I would like to observe that some FCS examples contain causative verbs, so that they describe the activity carried out by the constructional object rather than the constructional subject, as in (16).

(16)  I rattled out a box of candles.

In order to capture this fact, we could posit a variant of the FCS where the C component corresponds to the ECS, as in (17):

![Diagram showing the ECS variant of the FCS](image)

(17) shows that the transitive verb rattle is both associated with the F and the C components. In other words, the sound emission cooccurs with the movement of the box (as indicated by the C=ECS component, corresponding to the construction where intransitive rattle occurs) and such cooccurrence of events is due to a manipulator (hence the association of the verb with the force component).
3.4. Two differences between the FCS and the ECS

Given the systemic nature of language (i.e. language as a network), the ECS obviously does not subsume the cases mentioned in connection with the FCS (i.e., ‘true’ resultative examples). There are two differences between the FCS and the ECS and they concern the notions of (a) ordering of the subcomponents and (b) force.

3.4.1. Ordering

Whereas the FCS imposes a fixed temporal sequencing and a causal ordering for F and C (F precedes and causes C), the ECS doesn’t because it requires the E and C components to be projected onto each other (as indicated in the upper box within the ECS\(^4\)). This allows us to use the bottom boxes to express, when relevant (see below), the relation of causality between C and E. In other words, C and E are cooccurrent (upper box), but one (usually) causes the other (linear order of the boxes below).

(15b) illustrates the case in which E causes C. Note that examples like *The river froze solid (see (18a)) are analogous to (15b), the only difference being the association of freeze with both the E and C components; solid simply spells out the resultant state (cf. the notion of imposition of an ADC construal in Broccias 2000). (18b) illustrates the case in which C causes E (example from Goldberg 1995).

(18) a. 

\[
\begin{align*}
\text{the river} & \quad \text{froze} \\
\text{solid}
\end{align*}
\]

b. 

\[
\begin{align*}
\text{the fly} & \quad \text{out of the window} \\
\text{buzzed (i.e., The fly buzzed out of the window)}
\end{align*}
\]

(6), represented diagrammatically in (19), shows that the notion of causality is not always relevant for the ECS (as suggested by the lack of an ordering for E and C in (19)). What is crucial here is simply the cooccurrence of the E and C components.

\[\ldots\]

\[^{4}\] A similar idea, namely that of necessary temporal dependence, has been developed by Rappaport Hovav and Levin (1999). However, Broccias (2000) argues that a network approach such as the one proposed here correctly accounts for the impossibility of examples like *I washed clean (vs. I washed myself clean), which should be acceptable within Rappaport Hovav and Levins’s model.
3.4.2. Force
The ECS cannot be taken simply as a schema which groups together those cases where a force component is lacking (as is the case with intransitive resultatives). Example (6) contains a verb which can be conceptualized as implying a unidirectional energy flow \(\text{drink}\), and yet (6) is not associated with the FCS because no causal relation exists between the action denoted by the verb and the final state predicated by the PP. The examples in (7) and (9) cannot be linked to the FCS either, because they lack a necessary unidirectional energy flow from subject to object (see 2.3). On the other hand, they can be associated to the ECS because it is the E component (e.g., loving, following, playing) that determines the C component and the two can be said to be projected onto each other: the actions of loving, following, playing, etc. are constructed as paths leading to the state/position denoted by the resultative phrase. Therefore, we conclude that, when the notion of causality is relevant, the ECS is also compatible with a force dynamics scenario, provided that this is not identical to that evoked by the FCS.

A compact and simplified representation for (7a), which I will adopt here also for (9a-b), and (7b) is offered in (20a) and (20b) respectively. In (20a), the simple downward arrow expresses the intuition that the subject’s referent engages in a non-forcible relation with the object (i.e., the object is not affected). A force arrow connects the landmark to the trajector because the object’s referent is conceptualized as being responsible for the change of position/state of the subject.

In (20b), the double headed arrow is meant to indicate that both the subject exerts a force onto the object and that, as in (20a), the object is responsible for the subject’s change of state. This contrasts with the instantiations of the FCS, where the single headed arrow visualizes the fact that the energy flow is unidirectional (from the trajector to the landmark). (20b) also contains a dotted landmark to indicate that the object is optional.

The semantic pole for (9c–d) is given in (20c). The E component is represented through three component states (the circles connected to the squares). The C component is shown as the arrow connecting the three circles. Further, Langacker (1991: 363) notes that “the component states of a process constitute a set of interconnected entities and thus implicitly define an abstract region”. I
propose that constructions like (9c–d) profile such a region (represented as the circle encompassing the component states of the relevant process), which corresponds to the nonmanipulable object in the relevant construction.

(20) a. (see (7a), (9a–b))  I to distraction  
    you love

b. (see (7b))  I to the death  
    (it) fight

c. (see (9c–d))  the children

play leapfrog across the park

We still have to consider the body-part examples in (8a-c). They can be analyzed as instantiations of a schema, the Body-Part Schema (BPS, see (21)), which shares features of both the FCS and the ECS. As in the former, the BPS evokes a force dynamics scenario based on a unidirectional energy flow from subject to object (see the F component in (21)), but unlike the FCS it requires the identity of the M and the TH (i.e., we have subject-orientation for the XP as with the ECS); this is indicated by the dotted line connecting the two. Furthermore, the m stands in a part-whole relation with the resultant location (the square within the C component) as indicated by the line connecting the two in the lower boxes and by drawing the square box (the part) in the circle (the whole) in the upper box. Finally, the force component and the change component are projected onto each other (see the upper box in (21)) in analogy with what happens with the E and the C components in the ECS.

(21) BPS

the sea air slaps me in the face

4. Conclusions

In this paper I have shown that (a) the definition of resultative phrase adopted by Levin (1993) is too restrictive because it excludes various cases which are intuitively resultative but do not fall under her definition and (b) that the DOR cannot be maintained. I have suggested that a neater picture emerges if we
introduce the notion of ‘resultative network’. Within it, what are usually described as resultative constructions are instantiations of two units, the Force Change Schema, FCS, (which is relevant for ‘usual’ transitive cases such as They laughed me off the podium) and the Event Change Schema, ECS, (which is relevant for ‘usual’ intransitive cases like The river froze solid). I have also shown that the examples that do not fit Levin’s definition can be analyzed as instantiations of the ECS or instantiations of schemas, like the BPS, that share features of both the FCS and the ECS. The resultative network can be given a compact representation as in the following diagram:

(22)  The resultative network

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On the Topicalizing Nature of Multiple Left-dislocations

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0. Introduction
This paper considers one of the so-called Topicalizing constructions: Multiple Left-dislocation (MLD) in Spanish, and suggests that it does not involve multiple topics and should not be considered a Topicalizing device. It is proposed that MLDs have in fact a focalizing function, and that the notion “topic” should be re-examined.

Spanish is one of several Romance languages that allows for the construction in (1) referred to as Clitic left-dislocation (CLLD) by Cinque (1990):

(1) El libro lo tengo yo

the book cl have I

Prima facie, this structure seems to be a topicalizing construction. That is, as in other types of preposing mechanisms such as English Left-dislocation in (2), and English Topicalization in (3), the preposed element does not constitute the focus of the utterance:

(2) John, I saw him yesterday
(3) Julia I couldn’t reach

Thus, the sentences in (1)-(3) contrast with cases of Focus Preposing such as the one in (4), where the preposed element is focal:

(4) SIX DOLLARS it costs¹
(Ward 1988)

From this perspective, the preposed element in (1) has been assumed to be “topical”. However, one interesting feature of Romance CLLDs, not shared by

any of the mechanisms available in English, is that they allow for the simultaneous
dislocation of a variety of phrases. As the examples in (5)–(7) show, we can
dislocate several elements:

(5) Marcos a los niños les compró un libro
    *Mark prep the children cl bought a book*

(6) El cohete a los niños se lo compró Marcos
    *the rocket prep the children cl cl bought Mark*

(7) A los niños Marcos una pistola no se la compraría nunca
    *prep the children Mark a gun not cl cl would-buy never*

Furthermore, these phrases can be dislocated in any order:

(8) 
   a. Mark a los niños una pistola... 
   b. Una pistola Mark a los niños... 
   c. Una pistola a los niños Mark... 
   etc.

From a syntactic point of view, this feature has recently been accounted for
by positing a series of topic phrases to host the proposed elements or by
proposing multiple topic-features. Rizzi (1997), for instance, argues for several
topic heads where the Topic Criterion (similar to his Wh-criterion) can be
satisfied. Zubizarreta (1998), on the other hand, suggests that the Tense Phrase is
a syncretic category where features such as topic, focus or emphasis can combine
with the feature tense. To account for multiple topics, she suggests the following:

To the extent that there may be more than one topic per sentence, it is reasonable to
assume that there may be more than one “topic” feature that participates in the feature
checking algorithm. Thus, besides the “topic” feature on T, there may be a “topic” feature
on a functional category above TP. (Zubizarreta 1998:102)

However, from the point of view of information structure, two questions
immediately arise: what does it mean for a sentence to have multiple topics, and
why are multiple topics not possible in English?

This paper is organized as follows. In section 1, I examine what is meant by
topic and by multiple topics. Section 2 suggests that MLDs do not involve
multiple topics, and should not be considered a Topicalizing device. Finally, in
section 3, I briefly consider the problems that single topics still pose, and suggest
a re-examination of the notion “topic”.

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1. Topics and Multiple Topics

There are very different proposals for the articulation of information structure, which I cannot consider here. Therefore, I will just concentrate on the notion Topic in dichotomies such as the Topic-Comment or Theme-Rheme Articulation.²

Topic or Theme as a discrete element in the Topic-Comment or Theme-Rheme articulation, tends to be described with a combination of discourse and/or syntactic features such as: a) what the sentence is about; b) what the speaker takes as the point of departure for the sentence, c) not part of the focus; d) active or salient in the discourse; e) placed towards the beginning of the sentence (due to the unmarked order topic-comment); f) a subject (particularly a preverbal subject); and g) expressed by pronominal or unaccented lexical phrases. In (9) we have some relevant definitions from the literature:

(9) Some definitions of Theme/Topic
- What is usually called the psychological subject; the basis of the utterance; the element about which something is stated; what is being commented upon. (theme, Mathesius 1928, 1975)
- What is being talked about; the point of departure for the clause as a message; what comes first in the clause. (theme, Halliday 1967)
- Those elements which are assumed by the speaker to be present in the addressee’s consciousness. (theme, Contreras 1976)
- The thing which the proposition expressed by the sentence is about (topic, Lambrecht 1994)
- A referential entry under which propositions in the context set are classified (topic, Reinhart 1981)
- The address under which the hearer is instructed to enter the information (link, Valduví 1990)
- Topics are old or presupposed; the subject is the unmarked topic; pronouns must be interpreted as topics (topic, Erteschik-Shir 1997)

I will come back later to the problem of finding an appropriate definition for single topics, but if we just look at these definitions now to see if they could apply to more than one element, probably with the exception of being a subject, in principle, there is no reason why a sentence could not be about several things, or why a speaker could not take several elements as the point of departure, and definitely we can have several elements which can be salient in the discourse, unaccented or in pronominal form. This might be the reason why often definitions contain expressions such as “the element or elements”.

However, actual discussion of sentences with multiple topics is rare. Although multiple topics are sometimes mentioned, not much is offered in terms of their nature or interpretation. For instance, Halliday (1967:219) points out: “the

² See Casielles (1997), (1999) and Valduví (1990) for an examination of the different articulations and primitives.
function of theme, restricted elsewhere to single clause elements, can in the case of adjuncts extend over two or more.” He gives the example in (10):

(10) The other day in Sheffield I watched an interesting new process
    (Halliday 1967:219)

    In Contreras’ definition the plural elements is used and he does point out that
the feature +topic may be assigned to one or more elements. However, the
example he gives in (11) looks like a conjoined topic:

(11) En cuanto al dictador y al pueblo, éste lo repudia a aquél
    “As for the dictator and the people, the latter repudiates the former”
    (Contreras 1976:82)

    I did find the following example in Contreras (1976), which is similar to our
MLDs (it has two left-dislocated elements), but he does not offer any comment
about it.

(12) Don Fermín sus espuelas las sacó de la SALA
    “Don Fermín took his spurs from the room”
    (Contreras 1976:98)

    Erteschik-Shir (1997) mentions multiple topics, but only in the sense of
potential choices for topic, meaning that a sentence may have two phrases as
candidates for topic (for instance the subject and the object). Her system also
includes main and subordinate topics, but most of her data comes from English,
and there is no discussion of anything similar to our multiple dislocations.

Lambrecht (1994) argues that sentences can have more than one topic. This
happens when both the subject and object are pronominals as in (13):

(13) . What ever became of John?
    He married Rosa but he didn’t really love her
    (Lambrecht 1994:148)

Multiple topics are also possible, he argues, when we have a nonsubject
topicalized element, as in (14):

(14) Why am I in an up mood? Mostly it’s a sense of relief of having finished a
first draft of my thesis and feeling OK at least about the time I spent
writing this. The product I feel less good about.
    (Lambrecht 1994: 147)
According to him, in this case, both the topicalized element and the subject are topics. However, since we can have focal pronouns, it is not clear why being a pronominal immediately qualifies for being a topic. In addition, it seems to me that the appearance of the subject in (14) has more to do with syntactic requirements of English than with it being a topic.

Vallduvi (1990) takes into account Romance MLDs and suggests that sentences can have more than one topic (link, in his terminology). He gives the following Catalan example, which shows multiple links:

(15) El bròquil a l’amo l’hi van regalar
    the broccoli to the boss obj iobj 3p-pst-give
    Approx.: “The broccoli the boss (they) gave it to him (for free)”
    (Vallduvi 1990: 60)

Vallduvi suggests that a link is interpreted as the address under which the hearer is instructed to enter the information, and in the case of multiple links “the speaker directs the hearer to go to two addresses and enter the information under both”. So, the instruction for a sentence with multiple links such as that in (15) would be something like “I instruct you to go to the address the boss and the address broccoli and enter the information hates under both”. I cannot consider here Vallduvi’s system in depth, which I think has many advantages over other theories. However, in regard to multiple topics, it is not clear to me what the difference in interpretation is between multiple links and a link-focus-tail structure or a focus-tail-tail structure.

Vallduvi’s articulation involves the hierarchical trichotomy in (16), where the non-focal material, the Ground, is subdivided into the link, a sentence-initial topic, and the tail, any other non-sentence-initial topical element.

(16) Vallduvi’s Articulation
    S = {Focus, Ground}
    Ground = {Link, Tail}

A right-dislocated element, for instance, since it is not sentence-initial, would not be considered a link, but a tail. A tail specifies the way in which information is entered under a given address. So, the instruction for an example such as (17) below would be as follows: “I instruct you to go to the address the boss and then retrieve the information of the sentence by substituting hates for the blank in he____ broccoli, which is already under the boss.”

(17) L’amo l’ODIA, el bròquil
    the boss cl hates the broccoli
    link-focus-tail
From this perspective, then an MLD involves two addresses while a sentence which has a topic-tail structure, such as (17) involves only one address. It is not clear what the instruction would be for a multiple right-dislocation such as (18), where there is no link, and presumably no address.

(18) l'ODIA, l’amo el bròquil focus-tail-tail

I think that considering left-dislocated phrases topics and right-dislocated phrases tails fails to capture the similar nature of these structures. That is, the different structure proposed for these sentences in (19)–(21) does not reflect the fact that they all involve narrow focus on the verb:

(19) L’amo l’ODIA el bròquil link-focus-tail
(20) El bròquil l’amo l’ODIA link-link-focus
(21) l’ODIA, l’amo el bròquil focus-tail-tail

Vallduvi’s proposal has a key feature that should be kept: the distinction between a sentence-initial topic element and other non-focal elements. However, I think that instead of the multiple structures proposed for examples (19)–(21) we could offer a unified analysis for left- and right-dislocations, and suggest that the non-focal elements in all three cases above are instances of one non-focal element, different from a sentence topic and known in the literature as Background or Open Proposition (see below). From this perspective, although a sentence can have several non-focal elements, it cannot have multiple topics. This is also the view expressed by Reinhart (1981), who explicitly rejects the claim that a sentence can have two topics. She says that although conjoined topics are possible, a sentence uttered in a given context has in this context only one sentence topic (1981:56).\(^3\)

In the next section I suggest that Romance multiple dislocations (left or right) do not involve multiple topics, but a unique non-focal element, and I extend Vallduvi’s analysis of right-dislocations to left-dislocated structures.

2. MLDs: a Focalizing Device
One key feature of Vallduvi’s analysis of right-detachments in Catalan is the proposal that these elements are dislocated so that a different element gets sentence-final focus. From this perspective, a right-dislocation marks the detached element as non-focal.

Let’s look again at our Multiple Left-dislocations. I have repeated the examples in (22)–(24).

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\(^3\) Although I cannot go into details here, I believe that in Spanish and other Romance languages sentence topics are restricted to a non-dislocated sentence-initial position: the preverbal subject position.
On the Topicalizing Nature of Multiple Left-dislocations

(22) Marcos a los niños les compró un LIBRO  
    *Mark prep the children cl bought a book*

(23) El cohete a los niños se lo compró MARCOS  
    *the rocket prep the children cl cl bought Mark*

(24) A los niños Marcos una pistola no se la compraría NUNCA  
    *prep the children Mark a gun not cl cl would-buy never*

If instead of paying attention to the position where these elements have been placed, we pay attention to the position they would have occupied had they not been dislocated, we will see that these elements have not been dislocated because they are multiple topics (whatever that might mean) but so that a different element occupies the focal sentence-final position. That is, the non-dislocated unmarked structure for (22) would be (25):

(25) Marcos les compró un libro a los niños  
    *Mark cl bought a book prep the children*  
    "Mark bought a book for the children"

By removing *a los niños* from its unmarked sentence-final position, as we did in (22), the direct object *un libro*, ‘a book’ gets the sentence-final position and focal interpretation. So, this would be appropriate in a situation where it is under discussion that Mark bought something for the children and the speaker informs that what he bought for them is a book. The same applies to the other examples where removing certain elements from the VP results in marking the subject as focal, as in (23) or the negative quantifier never as in (24).

This raises one question, if the goal is to leave the book in sentence-final position, we do not need to place a los niños in the dislocated leftmost position, we could just place this phrase right before a book, as in (26).

(26) Marcos les compró a los niños un libro  
    *Mark cl bought prep the children a book*

One difference between (22) and (26), however, is that only (22) marks narrow focus on the direct object. As noted by Chomsky (1971), Contreras (1976), Selkirk (1984) and others, one feature of sentence-final focus is that it can project up to the whole verbal phrase.\(^4\) This means that if we leave *a los niños* inside the VP as in (26), it could be interpreted as focal. The left-dislocation in (22), on the other hand, marks this phrases as non-focal.

From this point of view, rather than a topicalizing device, this construction should be considered a focalizing device: by removing all these non-focal elements

\(^4\) For instance, Chomsky (1971) observes that in (i) any of the constituents in brackets can be part of the focus:

(i) He was (warned (to look out for (an ex-convict (with (a red shirt))))))
from the domain of focus projection, the intended element gets sentence-final focus-related accent. If this is right, rather than being similar to any of the Topicalizing mechanisms available in English, Romance Multiple left-dislocations are similar to structures such as (27)-(29), where narrow focus is marked intonationally, rather than syntactically.

(27) Mark bought a BOOK for the children
(28) MARK bought a rocket for the children
(29) Mark would NEVER buy a gun for the children

These sentences do not involve multiple topics, but a Focus-Background structure or Focus-Open proposition structure.

A Focus-Background structure is a structure involving a unique focal element. It is pragmatically marked in that it cannot start a discourse, it cannot be uttered out of the blue and requires a very specific context. The Background elements are pragmatically presupposed (either discourse-old or accommodated as such). In (30) we have some definitions:

(30) Some definitions of Background/Open Proposition
- The information in the sentence that is assumed by the speaker to be shared by him and the hearer (presupposition, Chomsky 1971, Jackendoff 1972)
- Salient shared knowledge; information which the speaker believes his/her hearer is attending to at the time of the utterance (open proposition, Prince 1981b, 1985, 1986, Ward 1988)
- That which is c-construable (which has a semantic antecedent in the previous discourse) (old information, Rochemont 1986)

While in English this structure tends to be expressed intonationally, that is, by intonationally focussing the unique focal element, as in (27)-(29), in Romance languages like Spanish, which prefer sentence-final focus-related accent, Background elements are taken out from the domain of focus projection, they are syntactically dislocated. From this perspective, the information structure of Multiple Left-Dislocations is not a Topic-Topic-Topic-Comment structure but a Background-Focus structure, as expressed in (31):

(31) Information Structure of MLDs:
Background-Focus (*Topic-Topic-Topic-Comment)

I believe this focalizing function is also true of single left-dislocations. Typical instances of non-multiple left-dislocations involve narrow focus. We have some examples in (32)–(34):
On the Topicalizing Nature of Multiple Left-dislocations

(32) El libro lo compró MARCOS
    the book cl bought Mark
    “MARK bought the book”

(33) El libro lo QUEMÓ
    the book cl burnt
    S/he BURNt the book

(34) El libro lo compró en ESPAÑA
    the book cl bought in Spain
    “S/he bought the book in SPAIN

Also, this explains why a sentence such as (35) sounds almost ungrammatical in isolation:

(35) #El libro lo compró

Since it is quite uninformative to say about a book that s/he bought it, as opposed to burned it, as in (33), it is hard to find the point of the utterance, the narrow focus. It could be rescued, for instance, in a very specific context where the speaker is emphasizing that this person BOUGHT the book as opposed to say borrowed it from the library. Sometimes the focus in these structures is the polarity of the sentence and in this case we find the affirmative or negative particle following the dislocated element, as in (36)–(37).

(36) El libro NO lo compró
(37) El libro SÍ lo compró

I believe the same applies to right-dislocations such as the one in (38):

(38) Lo compró MARCOS, el libro

In this sense, and although I do not want to imply that there are no differences between left- and right-dislocations, both can fulfill this focalizing function by removing certain elements from the domain of focus projection. We could still derive the interpretative differences between left- and right-dislocations from the different position of the Background.

Prince (1986) has pointed out that the Focus-Open Proposition structure can also be marked syntactically in English. As the examples in (39) show, clefts, pseudo-clefts and Focus Preposing structures mark this information structure.

(39) a. It was the SHIRT that she gave to Harry
    b. What she gave to Harry was a SHIRT
    c. A whole SET she gave to him
    (Prince, 1986:209)
In Romance languages, it is also possible to mark this articulation by dislocating all non-focal elements, so I would like to add Romance MLDs to the group of syntactic structures that can mark the Focus-Open proposition.

I will leave open here the syntactic structure of these MLDs, but if this is right, and they involve a Focus-Background structure, rather than having several topics move to different topic phrases, as Rizzi (1997) proposes, if we want to move these phrases and we want this movement to be triggered by a feature, I think it should be a [-focus] feature, that is, in these languages [-focus] elements need to escape the domain of focus projection. However, these phrases do not behave like moved elements, we can have as many as we want in any order over any barrier. In addition, we would need a separate analysis for right-dislocations. So, I would rather suggest that in Spanish and other Romance languages that maintain sentence-final focus, Focus-Background structures are syntactically expressed by freely base-generating all the non-focal or Background elements outside the domain of focus projection.

3. Further Issues: the Notion Topic
I will conclude with some brief comments about the problems that single topics still pose. As Polinsky (1999) has recently pointed out, linguists appear to have given up on a definition of topic. I suggest that the main reason why no appropriate definition has been found is because this unitary entity we have been trying to define does not exist. That is, due to the variety of phonological, morphological, lexical and/or syntactic ways in which languages can mark, if at all, topical elements, any specific definition of topic based on a particular language will not be adequate to characterize topical elements in a different language.

Recently Prince (1998) has shown that what had been considered to be homogeneous topic-marking constructions seem to involve different discourse functions. Jacobs (1999) has also pointed out that there are different semantic relations involved.

Here I have suggested that what are considered to be multiple topics are in fact part of the Background, and that this non-focal element should be distinguished from sentence topics. If we look for example at the features that sentence topics tend to have as opposed to Background elements, we see that although both have been referred to as topical, they do not have much in common. That is, as has been pointed out in the literature, sentence topics tend to correlate with a unique element in sentence-initial position, which has a discourse referent, and it is not necessarily discourse-old or unaccented. Background elements, on the other hand, are necessarily unaccented and discourse-old, while they do not correlate with any position in the sentence. So, in fact they seem to have quite different, if not opposite, characteristics.

I suggest that instead of trying to come up with a definition of topic, what we need to do is establish a typology of topical elements. Thus, I would argue for a
non-unitary characterization of this notion based on a collection of phonological, syntactic, semantic and discourse features. For instance, the differences between sentence topics and Background elements could be tentatively expressed as follows:

(40)  

\[ \text{Sentence Topic} \]
\[ + \text{sentence-initial} \]
\[ + \text{discourse referent} \]
\[ \pm \text{unaccented} \]
\[ \pm \text{discourse-new} \]

\[ \text{Background} \]
\[ \pm \text{single} \]
\[ \pm \text{sentence-initial} \]
\[ \pm \text{discourse-referent} \]
\[ - \text{unaccented} \]
\[ - \text{discourse-new} \]

From this point of view, some particular combinations of certain intonational, syntactic, and discourse features will give us different types of topical elements. What we need to do is examine how different languages mark non-focal elements and discover which are the relevant features, and how they combine to produce different types of topics.

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A Cognitive Account of the English Meronymic By Phrase

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1. Introduction
Various researchers have noted that some predicates in English permit the expression both of certain arguments and meronyms of those arguments – that is, both an entity and some zone or part of that entity. Langacker (1984) refers to these meronymic entities as active zones. In example (1), the active zone of the DOG, loosely speaking, is the TEETH, because of the semantics of bite, whereas the active zone of the CAT is unspecified in (1a) but can be instantiated in a separate constituent, as in (1b).

(1) a. Your dog bit my cat
    b. Your dog bit my cat on the tail with its sharp teeth.

Some of the past analyses (Langacker 1984, Jackendoff 1990) have briefly noted the differences among various prepositions, but they have neither analyzed the differences systematically, nor looked specifically at phrases with by, which has a very specific semantics, as opposed to in or on. In this study, I am concerned only with those constructions in which the preposition is by, and in which the referent of the object of the by phrase (HANDLE) is in a meronymic relationship with a given ENTITY (the direct object of an active sentence, or subject of a passive or unaccusative sentence) and is somehow construed as a "handle"; it is the point of contact between either the AGENT and ENTITY (2) or the GROUND and ENTITY (3). I call the whole construction H-BY.

(2) BNC: I got hold of him by the scruff of the neck and took him along to the police box and rang up for the wagon.2

(3) BNC: They belonged to a heavily built young man, hanging nonchalantly from the ceiling by his boots.

1 Thanks to Chuck Fillmore, Andreas Kathol, Eve Sweetser, the FrameNet project, George Bergman, Simon Corston-Oliver, Andrew Garrett, Kevin Moore, Len Talmy, and others who provided comments and feedback on this project.

2 Examples from the British National Corpus are prefaced with "BNC" so as to distinguish them from my own constructed ones.
In my analysis, I follow the work of researchers like Susan Lindner (1981) and Claudia Brugman (1988), who did extensive studies on the semantic and cognitive structures of English prepositions. However, I am also interested in exploring the core semantics of H-BY by looking at the kinds of lexical predicates and objects of the by phrase which can participate in it. For a similar approach, see, for example, Barker (1998), which analyzes the semantics of the English -ee morpheme (e.g., evacuee, amputee) by looking at constraints on the thematic roles of the participants, and by organizing the words formed with this morpheme into semantic or conceptual groups.

2. Methodology
The data for the study are all from the British National Corpus. My goals in collecting corpus data were: to find relevant and interesting examples of H-BY for qualitative analysis; to do the searches in consistent ways that would also allow for quantitative analysis; to develop hypotheses, and gather evidence about which classes of verbs participate in the H-BY construction; to gather negative evidence (that is, to actively look for H-BY in contexts in which it was not expected to appear so that infelicitous sentences could be constructed with some degree of confidence); and to find novel examples of uses of H-BY with verbs which might not fit the typical lexical prototypes.

3. Results I: Semantics of HANDLES
To see the most common uses of H-BY, it is informative to look at the ten most frequent lexical items of the HANDLES:

(4)

<table>
<thead>
<tr>
<th>Lemma</th>
<th>arm</th>
<th>hand</th>
<th>shoulder</th>
<th>hair</th>
<th>wrist</th>
<th>neck</th>
<th>throat</th>
<th>leg</th>
<th>foot</th>
<th>collar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freq.</td>
<td>74</td>
<td>61</td>
<td>60</td>
<td>35</td>
<td>28</td>
<td>27</td>
<td>20</td>
<td>17</td>
<td>17</td>
<td>16</td>
</tr>
</tbody>
</table>

Total tokens in sample: 592

Even allowing for possible metaphorical uses of these body part terms, it is clear that this construction is most commonly used in discussing the manipulation of humans and other animate entities. Articles of human clothing (collar, sleeve, lapel) are satisfactory body parts, for this purpose, as they are appropriate "handles" by means of which another person's body can be gotten under control. Other kinds of secondary locatives distinguish between body parts and clothing:

(5) Pat hit Chris
   a. on the chest
c. *on the shirt
   b. in the nose
d. *in the glasses
A Cognitive Account of the English Meronymic By Phrase

The highest frequency objects which are not, in their base meanings, parts of humans or animals (including clothing), with a frequency of 5 tokens each, are strap, handle, and root. Obviously, there is nothing grammatically wrong with sentences with inanimate ENTITIES, but they occur quite infrequently. This is not surprising; our entire understanding of an event of one human touching, restraining, or manipulating the body of another differs vastly depending on the specific body part. Compare sentences like:

(6)  a. Pat pulled Chris along by the hand / by the hair / by the feet.
     b. Pat picked up the cup by the handle / by the rim / by the bottom.

The selection of the body part completely reframes our understanding of the sentences in (6a), including the relationship of the participants to one another, because of the differences in how much control Chris has over the situation, in bodily orientation, and in physical, sociological, and psychological forces involved. However, in (6b), the differences in the exact place in which the object is touched do not reframe the sentences in these ways.

4. Analysis of valence patterns and diathesis alternations of predicates

One difficulty with traditional conceptual structure papers, such as Brugman (1988) and Lindner (1981), is that they rely largely on the intuitions of the researcher about the relationships between the different parts of the conceptual structure; in particular, for separating the uses of a particular lexical item or construction into different senses or classes, and rejoining them into conceptual clusters. Such arguments seem to me to be unfalsifiable, and therefore indefensible. A preferable technique is the one used by Fillmore (1968) to find 'covert' distinctions in uses of similar grammatical functions, and by George Lakoff (1987) in the analysis of the various constructional uses of English there (and followed by Bergen and Plauché (in press) in their analysis of the French deictic words voilà, voici, il y a); the observable evidence of syntactic alternation provides evidence for a category structure. Thus, I examined the data for diathesis alternations to find the syntactic behaviours of different instantiations of H-BY.

4.1 Diathesis alternations examined

4.1.1 Direct object realization

This is similar to Levin's (1993) "body part possessor ascension alternation"; the HANDLE in a by phrase can alternate as the direct object of the sentence.

The sentences in (7) may describe the same scene, while those in (8) may not:

(7) Pat grabbed Chris by the waist / Pat grabbed Chris' waist.

(8) Pat lifted Chris by the waist / *Pat lifted Chris' waist.

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3 For a further critique of these methods, see Sandra and Rice (1995).
4.1.2 **H-BY required**
Some sentences, as in (9), allow paraphrases, which may be underspecified, but still essentially describe the scene, by removing the H-BY phrase altogether, while others do not, as in (10) below:

(9) I grabbed Chris *by the hand / I grabbed Chris
(10) I plucked Chris *by the sleeve / *I plucked Chris

4.1.3 **Conative alternation**
Some verbs allow for a conative alternation, in which the phrase with H-BY is loosely paraphrasable by substituting *on or at*:

(11) a. BNC: Benjamin tugged Ruthven *by the sleeve, indicating he wished to talk to him.*
    b. Benjamin tugged on/at Ruthven’s sleeve.
(12) a. BNC: George dragged her upright *by her hair.*
    b. *George dragged on/at her hair.

4.2 **Participant role alternations**
In addition to diathesis alternations, in which semantic constituents in the sentence can be instantiated in different grammatical functions, I also regard participation in a frame, as defined by Chuck Fillmore’s frame semantics (e.g. Fillmore 1992, Fillmore & Atkins 1992), to be a kind of evidence for positing a particular category. One piece of evidence that a group of predicates share a common frame is that they have similar semantic participant roles, in addition to those which are basic participants in the H-BY construction (ENTITY, HANDLE)

4.2.1 **CONNECTOR**
Some verbs allow a CONNECTOR phrase, as well as an H-BY phrase:

(13) BNC: The boy was tied with a rope *by his feet ...*

Here, the CONNECTOR phrase looks more like a MEANS OF phrase. However, the more common way for the connector to be instantiated is with *by*, which makes it a bit difficult to distinguish the HANDLE uses of the by-phrase from the CONNECTOR uses. A clear example of a connector use is in (14):

(14) BNC: A bloody-mouthe d mastiff tied by a chain to a lintel of a door snarled and barked. (compare with H-BY tied by its neck to a lintel)

Difficulties occur because many sentences are ambiguous about whether the object of the BY phrase is a “part” of the ENTITY, as in (15):

(15) BNC: He pointed to the binoculars hanging by their strap from the arm of his chair.

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While it is typically the case that the HANDLE in H-BY is a meronym of the ENTITY, meronymy is loosely construed enough that a test for meronymy would be only marginally helpful in these overlap cases – for example, "clothing" is an acceptable HANDLE, while it is not strictly speaking a meronym. On the other hand, clothing is part of the frame of a human being, as the strap is part of the frame of binoculars. We can see this through the use of possessives (hanging by their strap) or the definite article (pulled him by the sleeve); this is not possible with pure connectors (*a mastiff tied by the chain to a lintel).

Another piece of evidence for a CONNECTOR as opposed to a HANDLE is purely semantic: the prototypical connector is a long, thin, extended object, such as rope, chain, wire, stalk, thread, strap, etc; it is less of a point of contact than a bridge between figure and ground. Other pieces of evidence are standard tests for means or instrumental relationships: CONNECTORS may alternate as the subjects of active sentences (if passive), or they may be paraphrased with with instead of by. The object in an H-BY phrase is not construable as an instrument:

(16)  
  a. The dog was tied by a chain to the door.
  b. The dog was tied with a chain to the door.
  c. A chain tied the dog to the door.

(17)  
  a. The dog was tied by its neck to the door.
  b. *The dog was tied with its neck to the door.
  c. *Its neck tied the dog to the door.

4.2.2 GROUND
Some of the scenes evoked by H-BY allow an instantiation of a GROUND constituent. The interpretation of these scenes is that the HANDLE is in contact with the GROUND and not with an AGENT. The preferred preposition may be to, as in (18) or from, as in (19):

(18)  
  BNC: He was handcuffed and taken to a locker room where he was chained to a metal grille by the arms and legs.

(19)  
  BNC: I said I'd remember that if ever I found him dangling upside down by one toe from a ski-lift cable.

4.2.3. PATH or GOAL constituent
Some of the scenes evoke a potential GOAL or PATH constituent. These are the scenes in which the ENTITY is a theme; it is participating in a caused-motion frame.

(20)  
  BNC: Then another diver dragged the shark by its tail to the beach ...

5. Results II: Semantics of predicates
Inspecting the possible valence patterns and diathesis alternations of particular lexical verbs showed that verbs cluster into several semantic groups,
summarized in (21). These groups were posited based on their behaviour with respect to the H-BY phrase in particular; while they bear some relation to standard classifications of verbal predicates into clusters (for example, FrameNet frames (for details, see the homepage at http://www.icsi.berkeley.edu/~framenet) or Levin's (1993) verb classes), they are at least partially orthogonal to them. In particular, because the meanings of these sentences are relative to scenes, different instantiations of the same verb in different contexts might fall into different conceptual groups even if one wouldn't ordinarily think of them as being different senses per se. For example, attested uses of pluck fall into three different groups with respect to H-BY: pluck (a person) by the sleeve (MANIPULATE), pluck out (a doll) from a toy chest by the waist (LIFT), pluck out (a hair) by the roots (PLUCK).

Based on these syntactic observations, as well as semantic entailments (discussed in detail below), I propose 6 conceptual groups of predications which have affinity for the H-BY construction. (21) below shows the ways in which the diathesis alternations and instantiations of the participant role structures are varied according to the conceptual groups:

(21) Diathesis alternations and participant role patterns of semantic groups

<table>
<thead>
<tr>
<th></th>
<th>HOLD</th>
<th>MANIPULATE</th>
<th>ATTACH</th>
<th>HANG</th>
<th>CONVEY</th>
<th>PLUCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct object realization</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>H-BY required</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Conative</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CONNECATOR</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>GROUND: to</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>GROUND: from</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>PATH/GOAL</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>X</td>
</tr>
</tbody>
</table>

5.1 HOLD

catch, clasp, get, get hold of, grab, grasp, grip, hang on, have, have hold of, hold, seize, snatch, take, throttle

This group entails that there is contact between the AGENT and the HANDLE such that the whole entity is controlled.

(22) a. BNC: He was still clapping her by the shoulders ...
   b. BNC: Scott grabbed him by the lapels and hauled him to his feet.
5.2 MANIPULATE

*pluck, press, shake, squeeze, tweak*

In this set, the agent is also in contact with the HANDLE of the entity so as to get it under control, but the action is construed as affecting the HANDLE more than the entity as a whole. For that reason, the sentence no longer has the correct entailments without reference to the H-BY phrase, which is why the H-BY phrase is required. It entails the HOLD schema; to tweak you by the nose, I must hold you by the nose.

(23) a. BNC: Soon the Mayor was shaking the Captain by the hand.
b. *The Mayor was shaking the Captain (with the same interpretation)*

(24) a. BNC: Harriet plucks me by the sleeve and whispers, "Mummy, what will Tracey's Gran do now she's dead, if she wants to go to the loo?"
b. *Harriet plucks me and whispers ....

5.3 ATTACH

*anchor, attach, bind, chain, connect, harness, knot, nail, pin, tie, trap*

In almost all cases, these sentences entail a means of attachment, which may be instantiated through a CONNECTOR phrase with by or a different preposition like with (tied with a rope), or by incorporation into the verb itself (chained by the legs). These sentences necessarily entail a GROUND, which can be stated, in (25), unstated, as in (26), or reflexive, as in (27):

(25) BNC: ... he was chained to a metal grille by the arms and legs.
(26) BNC: He said that he hadn't been treated 'badly', but had, like Jenco and Jacobsen, been chained by one or both ankles for most of the time.
(27) BNC: A cream sweater was knotted by its sleeves around his neck.

5.4 HANG

*dangle, hang, string up, suspend, swing*

This concept group entails the ATTACHMENT schema; to overcome gravity, the hanging ENTITY must be attached to a GROUND. Differences between the HANG and ATTACH groups in syntactic instantiation include the choice of preposition for the GROUND constituent (from vs to) and the possibility of unaccusative verbs, as in (28) with H-BY, none of which were found in the ATTACH group:

(28) BNC: my harness slipped and I dropped ten thousand feet hanging by one leg
(29) BNC: he was gazing at a row of hares suspended by their feet from a rack

5.5 PLUCK

*pluck, pull, yank (by the part at which it was attached)*

A few verbs of traction require interpretation of the by-phrase not as a handle, but as the point at which the ENTITY was attached to a GROUND before
its extraction from that ground; it presupposes an ATTACHMENT schema. Perhaps not surprisingly, the only word which was the object of the by phrase with this usage was root, e.g.:

(30) BNC: A rotating mechanism traps the hair and plucks it out by the root.

5.6 CONVEY
carry, guide, drag, draw, haul, help, hoist, lead, lift, lug, pick up, pull, tow, tug, yank

These change-of-location propositions do not allow the instantiation of the object of H-BY as the direct object of the verb (with the same meaning):

(31) a. BNC: Drag me off to your lair by my hair, perhaps?
b. *Drag my hair off to your lair.

These scenes allow directional GOAL and PATH adjuncts like above, where to your lair is a GOAL); in some cases, directional information is incorporated in the semantics of the verb, as in (32) below, where the PATH (UP) is incorporated into the semantics of the verb.

(32) BNC: she lifted the calliper by its straps and flung it over the small cliff.

5.6.1 Subclasses of CONVEY co-occurring with H-BY
Propositions in this group fall into three general subclasses with different entailments – in particular, different force-dynamic entailments (Talmy 1988), and entailments about the animacy and volitionality of the ENTITY. However, the syntactic instantiations of the participant roles are not affected by these subclasses, and they do not differ with respect to the interpretation of the by phrase itself; thus they should be considered equally part of the CONVEY group.

5.6.1.1 LIFT predications (lift you by the waist, pick up a bottle by the neck)
These sentences specify that that PATH is upwards, or against gravity. The ENTITY is understood not to contribute to the force of the caused-motion, nor to hinder the caused motion through its tendency to move in the opposite direction by any volitional action. The animacy of the ENTITY is therefore not a factor in the interpretation of the proposition.

(33) BNC: [he] picked him up by both elbows and pulled him on to his lap.

5.6.1.2 DRAG predications (drag you by your hair, pull a cart by the handle)
These sentences imply a PATH which is non-specified for verticality. The ENTITY is understood to be caused by the AGENT to be moving along a path which the ENTITY otherwise resists moving along. The ENTITY may be either animate or inanimate, but if animate, as in (34), it is understood to neither be resisting nor helping the caused-motion:
A Cognitive Account of the English Meronymic By Phrase

(34) BNC: A tiger snatched a five-year-old girl from a van full of tourists after smashing a window with a paw and dragging her away by the head.

5.6.1.3 LEAD predications (pull you by the hand, guide you by the elbow)
These sentences are similar to the DRAG predications, but the ENTITY must be animate; while the DRAG predications are specifically caused-motion, the LEAD predications are better thought of as causing or assisting the ENTITY to participate in an act of self-motion. This is a psychological instantiation of the TRACTION schema; any resistance is at least partially psychological, due to lack of volitionality or ability (to have the motion caused), as in:

(35) BNC: Five children were yanked by arm or hand across a road.

Unlike in (33) and (34) above, the physical force of the traction is probably not the only thing causing the motion; the ENTITY, though perhaps unwilling, may still contribute to the direction of motion. Another possible cause of resistance is the inability to find a path, or the inability for the ENTITY to move along a path on its own:

(36) BNC: ... the gentleman had every right to take the woman’s arm and even, over a rough patch, help her by the waist.

5.6.2 Subclasses not readily occurring with H-BY
The three subclasses of caused-motion verbs above are particularly interesting in light of the subclasses of caused-motion verbs which do not occur in conjunction with H-BY. That is, the possibility of an H-BY phrase is not a general property of caused-motion clauses; it is specifically these types of verbs which allow it.

5.6.2.1 Verbs in primarily non-spatial frames (0 instances found)
Verbs which may entail causing an entity to move but which have their emphasis on social forces – that is, which are not primarily spatial or physical in their frame – do not co-occur with H-BY. To give just a few of the many examples, these includes verbs of commercial transaction – buy, sell, etc. (Fillmore 1992) and verbs of “possessional deprivation” (Levin 1993) like steal, filch, or embezzle:

(37) a. *Pat stole the shovel by the handle
b. *Pat bought the shovel by the handle

Because these predicates focus on the means behind the transfer of possession rather than on the motion of the ENTITY (though the ENTITY is often also necessarily or implicitly being moved), the secondary locative may not be used.

5.6.2.2 Verbs of pushing (1 instance found)
A priori, there does not seem to be anything wrong with sentences like these:
I pushed the shopping cart by its handle.

Pat shoved Chris by the shoulders.

However, they are simply not found in the corpus. The table in (40) shows the results of 390 PUSH verbs and 474 PULL verbs inspected; only 1 case of H-BY was found for PUSH verbs, as compared with 71 for the PULL verbs.

<table>
<thead>
<tr>
<th></th>
<th>Lemma</th>
<th>Verb freq</th>
<th>Freq of verb near by</th>
<th>Sentences inspected(^4)</th>
<th>H-BY found</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUSH</td>
<td>push</td>
<td>90mathl74</td>
<td>294</td>
<td>200</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>shove</td>
<td>742</td>
<td>21</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>press</td>
<td>7068</td>
<td>169</td>
<td>169</td>
<td>1</td>
</tr>
<tr>
<td>PULL</td>
<td>drag</td>
<td>3075</td>
<td>159</td>
<td>159</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>pull</td>
<td>13616</td>
<td>390</td>
<td>200</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>haul</td>
<td>1007</td>
<td>115</td>
<td>115</td>
<td>8</td>
</tr>
</tbody>
</table>

Both sets of verbs have the same kinds of participants, and the same kinds of thematic roles, and can participate in many of the same alternations. However, they have radically different affinities for the H-BY construction. The reason for this, of course, is that the force dynamics of the actions suggested by verbs of traction may actually require some kind of handle for the action to be completed (consider the difficulties of opening a door towards you if the handle has been removed). However, the actions suggested by the verbs of pressure generally do not require handles (a door opening outward needs no handle).

5.6.2.3 Verbs of release (1 instance found)
Since these verbs are metonymically related to HOLD (the interpretation is that the AGENT was holding the ENTITY by the HANDLE at the time of its release), I inspected sets of these verbs for examples of H-BY (cast, catapult, chuck, drop, eject, fling, flip, heave, pitch, sling, throw, tip, toss, eject). However, the only example I found of one of these verbs participating in H-BY was:

(41) BNC: the snake stirred as David dropped the mouse by its tail into the terrarium.

Again, while H-BY is certainly possible with some of these verbs, this is rather a marginal class, possibly because these verbs foreground the end state of the action, at which time the AGENT is no longer in contact with the HANDLE.

\(^4\) Because each sentence with the target verb near by had to be manually judged as an instance of H-BY or not, I inspected a maximum of 200 instances of each verb.
5.6.2.4 Verbs of spatial configuration (0 instances found)
Verbs of spatial configuration (Levin 1993) (lay, place, sit, stand, etc.) which aren’t specifically HANG verbs do not show affinity for this construction - again, at the end state of action, there is no contact between AGENT and HANDLE. Note that (42b) is completely uninterpretable a meaning where the handlebars are a point of contact with the AGENT (Pat), but that it is not so bad with an interpretation where the handlebars are the point of contact with the GROUND (wall) at the end state, which supports this explanation.

(42)  a. *Pat put the knife on the table by the handle.
       b. *Pat stood the bike against the wall by the handlebars.

6. Conclusions
Given these different subcategories of semantics of H-BY, can a unified semantics of H-BY be proposed? Probably not, if by “unified” one means a necessary and sufficient set of semantic conditions. However, an inspection of the subgroups makes apparent certain schemata which are central to the various uses; most saliently, these schemata include ATTACHMENT/HOLDING and TRACTION. In the most prototypical uses of H-BY, we find both of these schemata at work (e.g. the DRAG, HANG, and PLUCK groups); in others, we may find only one of them (e.g. LEAD necessarily entails physical or psychological traction but not necessarily physical attachment; MANIPULATE entails HOLDING but not necessarily TRACTION). In addition, the various subcategories of the CONVEY predicates which do not have affinity for H-BY are those in which these schemata are not present or not salient. This suggests a family resemblance type polysemy structure of the H-BY construction; all nodes have similarities to at least one other node, and yet the description of only those features which all nodes have in common would be far less than a full specification of the construction.

References


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Sonority-Driven Reduction

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University of Rochester

0. Combinations of Sonority and Stress
In their analysis of Imdawn Tashhiyt Berber syllabification, Prince and Smolensky (1993) postulate that different types of prominence, such as sonority and syllabicity, should align—a phenomenon they term prominence alignment. This concept is implemented by Prince and Smolensky using families of inherently-ranked constraints that are derived from combining phonetic prominence scales. The types of constraints they use are illustrated in (1), along with the prominence scales used to derive them:

(1) Prominence Constraints (Prince and Smolensky 1993, chapter 8)

*M/a >> *M/i >> ... >> *M/t (*)M/λ = λ must not be parsed as a margin.)
*P/t >> ... >> *P/i >> *P/a (*)P/λ = λ must not be parsed as a peak.)

Syllable Position Prominence: P > M (peaks are more prominent than margins)
Segment Sonority Prominence: a > i > ... > t

Kenstowicz (1994) has demonstrated that the prominence alignment phenomenon is not unique to syllabification phenomena. Specifically, Kenstowicz shows that prominence alignment can affect stress placement. He examines a number of languages in which stress placement is affected by the relative sonority of the vowels in a given word. For example, in Kobon (cf. (2a)), stress is attracted by high sonority vowel: stress generally falls on the most sonorous non-affixal vowel in the word. Similarly, in Northwest Mari stress is repelled by low sonority vowels: stress generally falls on the penult, but will move leftward to avoid falling on certain low-sonority vowels such as [i] (cf. (2b)).

(2) Sonority-Driven Stress (Kenstowicz 1994)

a. Kobon (stress attracted by high sonority)

<table>
<thead>
<tr>
<th>stressed [a:]</th>
<th>kidnómán</th>
<th>'arrow type'</th>
<th>ki.á</th>
<th>'tree sp.'</th>
</tr>
</thead>
<tbody>
<tr>
<td>stressed [o]</td>
<td>mó.u</td>
<td>'thus'</td>
<td>si.óg</td>
<td>'bird sp.'</td>
</tr>
<tr>
<td>stressed [i,u]</td>
<td>wí.or</td>
<td>'mango tree'</td>
<td>mú.is</td>
<td>'fungus sp.'</td>
</tr>
</tbody>
</table>

b. Northwest Mari (stress repelled by low sonority)

<table>
<thead>
<tr>
<th>penult stress:</th>
<th>jálúntó</th>
<th>'heel'</th>
<th>roséta</th>
<th>'sprouts'</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-penult stress</td>
<td>tígěńkí</td>
<td>'such a'</td>
<td>kídřtüzí</td>
<td>'in his hand'</td>
</tr>
</tbody>
</table>
Kenstowicz terms this type of stress system "sonority-driven stress", and analyzes it using the same prominence alignment mechanism developed by Prince and Smolensky (1993). The constraints used by Kenstowicz are illustrated in (3):

(3) Constraints on Stress/Sonority Combinations (Kenstowicz 1994)
- **Targeting Low Sonority**: Non-sonorous vowels should not be in stressed position:
  *Stressed/ə >> *Stressed/i,u >> *Stressed/e,o >> *Stressed/a
- **Targeting High Sonority**: Sonorous vowels should not be in unstressed positions.
  *Unstressed/a >> *Unstressed/e,o >> *Unstressed/i,u >> *Unstressed/ə

In this paper, I argue that exactly the same constraint families used by Kenstowicz to predict stress placement in sonority-driven stress systems can also motivate vowel quality alternations. In particular, the *Unstressed/X constraint family will be shown to motivate a particular type of vowel reduction, termed here "sonority-driven reduction". This finding is interesting because it provides attestation for the fourth and final member of the predicted typology of the possible ways in which sonority and stress can combine under the prominence alignment hypothesis.

1. **Types of Vowel Reduction**
Vowel reduction is a common phonological phenomenon in which (some) vowels undergo qualitative neutralizations in unstressed position. In sonority-driven reduction, it is precisely the high-sonority vowels that undergo reduction in unstressed position. In order to further clarify the exact nature and analysis of sonority-driven reduction, it may be helpful to compare and contrast it with a different sort of vowel reduction phenomenon. In previous work on vowel reduction, I have demonstrated that there are at least two classes of this phenomenon: sonority-driven reduction and perception-based (contrast-enhancing) reduction (Crosswhite 1999). Although both types of phenomena cause vowel neutralizations in unstressed syllables, they differ along a number of parameters, all of which relate to the fact that sonority-driven reduction is motivated by an inherently ranked set of prominence constraints. For example, whereas sonority-driven reduction targets vowels by sonority class, perception based reduction can target (presumably) any natural class of vowels. Furthermore, whereas sonority-driven reduction always uses sonority-decreasing neutralizations, perception-based reduction is not subject to this limitation.

Two examples of sonority-driven reduction are illustrated in (4) below. Note that in both cases, the high sonority mid and low vowels are subject to reduction in unstressed position. Furthermore, note that these vowels are eliminated using neutralizations that decrease sonority. (Note: although [ə] is often described as a mid vowel, it is in fact very low in sonority—for example, it uses a very close jaw position similar to that seen with [i,u] (Petterson and Wood 1987b).)
(4) Sonority-Driven Reduction

<table>
<thead>
<tr>
<th></th>
<th><strong>Bulgarian</strong></th>
<th></th>
<th><strong>Catalan</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>u</td>
<td>e</td>
<td>o</td>
</tr>
<tr>
<td></td>
<td>↑</td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>e</td>
<td>o</td>
<td>e</td>
<td>a</td>
</tr>
<tr>
<td></td>
<td>↑</td>
<td></td>
<td>↑</td>
</tr>
</tbody>
</table>

Note that the neutralizations used in these two example cases are different (Bulgarian /e/ > [i] while Catalan /e/ > [ə], for example), although the resulting vowel sub-inventories are identical ([i,u,ə]). This results from the fact that the same vowel reduction constraints motivate the process in both languages—these constraints are illustrated in (5) below. However, the different neutralization patterns result from different rankings of vowel faithfulness constraints with respect to the members of the *Unstressed/X family. For example, in Bulgarian it is imperative to preserve underlying palatality and rounding, while in Catalan underlying palatalitl can be lost under reduction.

To see how this analysis works, let us consider the case of Bulgarian vowel reduction. The pertinent features of Bulgarian vowel reduction are: unstressed vowels that are high in sonority are eliminated, and the neutralizations used to eliminate them do respect underlying vowel palatality and rounding, but do not respect underlying height. This system can easily be modeled by ranking vowel faithfulness constraints for [front] and [round] very high, while ranking vowel faithfulness for [high] and [low] very low. This is illustrated in (5) below:

(5) Constraint Ranking for Bulgarian

\[
\begin{align*}
*\text{Unstressed}/a & \quad *\text{Unstressed}/i,u,\partial \\
*\text{Unstressed}/e,o & \quad \text{Ident}[\text{high}] \\
\text{Ident}[\text{front}] & \quad \text{Ident}[\text{low}] \\
\text{Ident}[\text{round}] & \\
\end{align*}
\]

As demonstrated in the following tableaux (6) for reduction of underlying unstressed /e/ and /o/, this ranking derives the correct neutralization patterns. (Note that only one of the lowest-ranked constraints Ident[high] and Ident[low] are shown per tableau, due to space limitations.)

---

1 Lehiste & Popov 1970, Scatton 1984, Groen 1987, Petterson & Wood 1987a,b
2 Recasens 1991, Mascaró 1978
(6) Tableaux for Bulgarian Unstressed /o/ and /a/:

(cf. [róguf] ‘of horn’)

<table>
<thead>
<tr>
<th></th>
<th>Ident [round]</th>
<th>*Unstr.-a</th>
<th>*Unstr.-e,o</th>
<th>*Unstr.-i,u,ε</th>
<th>Ident [high]</th>
</tr>
</thead>
<tbody>
<tr>
<td>✗ [rugát]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[rogát]</td>
<td></td>
<td></td>
<td>!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[rogát]</td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[rigát]</td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(cf. [grát] ‘city’)

<table>
<thead>
<tr>
<th></th>
<th>Ident [round]</th>
<th>*Unstr.-a</th>
<th>*Unstr.-e,o</th>
<th>*Unstr.-i,u,ε</th>
<th>Ident [low]</th>
</tr>
</thead>
<tbody>
<tr>
<td>✗ [graděts]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[graděts]</td>
<td></td>
<td></td>
<td>!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[graděts]</td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the first tableau, underlying unstressed /o/ must reduce to [u], since reduction to any other low-sorority vowel (i.e., [ə] or [i]) involves violation of Ident[round]. Furthermore, non-reduction of unstressed /o/ is not an option, since this violates the highly-ranked constraint *Unstressed/e,o. Similarly, the second tableau shows that reduction of unstressed underlying /a/ to [u] is not an option because this also violates the Ident[round] constraint, and non-reduction of /a/ violates *Unstressed/a. Although both winning candidates violate a height-based faithfulness constraint (either Ident[low] or Ident[high]), these constraints are ranked so low that they cannot affect the choice of the optimal output form.

2. The Necessity of Prominence Constraint Families

In the previous section, we saw that prominence constraints can be used to account for sonority-driven reduction. Is there any evidence that it is the necessary approach? In order to answer this question, it may be useful to consider a different type of vowel reduction—one that is not based on sonority. The vowels targeted for perception-based reduction constitute some perceptually-challenging natural class of vowels, such as the mid vowels or nonperipheral vowels. Furthermore, these vowels can be eliminated in a number of different ways, including lowering, raising, tensing, or centralization. Two examples of perception-based reduction are provided in (7):
Sonority-Driven Reduction

(7) Perception-Based Reduction

<table>
<thead>
<tr>
<th>Algueres Catalan³</th>
<th>Bergün Romansch⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>i → u ↑</td>
<td>i → u ↑</td>
</tr>
<tr>
<td>e → o ↓</td>
<td>e → o ↓</td>
</tr>
<tr>
<td>a</td>
<td>a</td>
</tr>
</tbody>
</table>

This type of vowel reduction can be analyzed using a single position-specific constraint—either a positional markedness constraint (Steriade 1994a,b, Zoll 1998) or a positional faithfulness constraint (Beckman 1998). As pointed out by Beckman (1998), either type is sufficient for vowel reduction. For concreteness, I will adopt a positional markedness approach to perception-based reduction. Therefore, the two examples of perception-based reduction illustrated in (7) above can both be derived using the constraint shown in (8). The different neutralization patterns result from different rankings for vowel faithfulness constraints:

(8) License[Mid]/stress: Mid vowels are licensed only under stress.

Is there any basis for using different formal mechanisms to account for these two types of reduction? Put another way—is there any evidence that sonority-driven reduction requires a family of inherently-ranked constraints, rather than a single, unitary vowel reduction constraint targeting non-high vowels?

The utility of the prominence alignment approach is that it allows us to use a finer-grained approach to vowel desirability. Under the unitary-constraint approach (cf. (8)), a given unstressed vowel is either good or bad: the distinction is binary. Under the prominence alignment approach, unstressed high vowels and [ə] are pretty good, unstressed mid vowels are worse, and unstressed low vowels are terrible. What we need is evidence that sonority-based reduction systems consider unstressed low vowels to be worse than unstressed mid vowels.

In fact, there are two types of evidence that suggest that this is precisely the case: the existence of sonority-driven reduction targeting only low vowels, and the occurrence of partial blockage of sonority-driven reduction in which unstressed mid (but now low) vowels surface without reduction.

The first such case is Sri Lankan Portuguese Creole (Smith 1978), in which the three underlying low vowels /æ,a,ʌ/ cannot occur in unstressed position, and instead alternate with the corresponding mid vowel or [ə]:

---
³ Recasens 1991
⁴ Lutta 1923, Kamprath 1991
Katherine M. Crosswhite

(9) Sri Lankan Portuguese Creole (Smith 1978)

<table>
<thead>
<tr>
<th>Stressed Low Vowels</th>
<th>Same Vowels Unstressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>unstressed (v &gt; o)</td>
<td>ūbrə</td>
</tr>
<tr>
<td></td>
<td>nó:mi</td>
</tr>
<tr>
<td></td>
<td>obré:ru</td>
</tr>
<tr>
<td></td>
<td>nomin:ä</td>
</tr>
<tr>
<td>unstressed (æ &gt; e)</td>
<td>pæ:ðɔɾə</td>
</tr>
<tr>
<td></td>
<td>fæ:ɾu</td>
</tr>
<tr>
<td></td>
<td>pedriyã:du</td>
</tr>
<tr>
<td></td>
<td>feré:ru</td>
</tr>
<tr>
<td>unstressed (a &gt; æ)</td>
<td>bájlu</td>
</tr>
<tr>
<td></td>
<td>bâ:rə</td>
</tr>
<tr>
<td></td>
<td>bajlðó:r</td>
</tr>
<tr>
<td></td>
<td>bɔrvé:ru</td>
</tr>
</tbody>
</table>

Intuitively, this phenomenon is very similar to the sonority-driven reduction case seen in Bulgarian: unstressed high sonority vowels are eliminated in such a way as to preserve underlying palatality and rounding. The only difference is that Sri Lankan Portuguese Creole does tolerate unstressed mid vowels, whereas Bulgarian does not. This type of system can easily be modeled using the Bulgarian constraint ranking as a starting point—the constraint Ident[high] simply needs to be ranked slightly higher, as illustrated in (10). In effect, this makes the presence of an unstressed mid vowel slightly less important since the constraint *Unstressed/e,o is now dominated by the conflicting constraint Ident[high].

(10) Tableaux for Sri Lankan Unstressed /æ/ and /a/:  

(cf. [fæ:ɾu] ‘iron’)

<table>
<thead>
<tr>
<th></th>
<th>Ident [front]</th>
<th>*Unstr.-[a]</th>
<th>Ident [high]</th>
<th>*Unstr.-[e,o]</th>
<th>*Unstr.-i,u,ɔ</th>
<th>Ident [low]</th>
</tr>
</thead>
<tbody>
<tr>
<td>[færé:ru]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[færé:ru]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[færé:ru]</td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(cf. [bájlu] ‘dance’)

<table>
<thead>
<tr>
<th></th>
<th>Ident [front]</th>
<th>*Unstr.-[a]</th>
<th>Ident [high]</th>
<th>*Unstr.-[e,o]</th>
<th>*Unstr.-i,u,ɔ</th>
<th>Ident [low]</th>
</tr>
</thead>
<tbody>
<tr>
<td>[bajlðó:r]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[bajlðó:r]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[bajlðó:r]</td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[bajlðó:r]</td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that the ranking between the constraints *Unstressed/a and Ident[high] could be reversed, hence the dotted line separating these two tableau columns. What is imperative is that both Ident[high] and *Unstressed/a outrank *Unstressed/e,o—a ranking that can only be set in place if *Unstressed/a and *Unstressed/e,o are in fact separate entities in the grammar. In the Bulgarian grammar, the lower ranking of Ident[high] prevented it from affecting the outcome. With a higher rank for Ident[high], reduction via raising is ruled out, highlighting the different effects of *Unstressed/a and *Unstressed/e,o.
Sonority-Driven Reduction

A similar phenomenon occurs in standard Catalan. Standard Catalan has a 7-vowel inventory under stress: /i,u,e,o,e,a/. In unstressed positions, this is reduced to the 3-vowel sub-inventory [i,u,e]. This is illustrated in (11):

(11) Standard Catalan Vowel Reduction

<table>
<thead>
<tr>
<th>V UNDER STRESS</th>
<th>SAME V UNSTRESSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>/a,e,e/ &gt; [a]</td>
<td>sák ‘sack’</td>
</tr>
<tr>
<td></td>
<td>pɛl ‘hair’</td>
</tr>
<tr>
<td></td>
<td>sɛrp ‘snake’</td>
</tr>
<tr>
<td>/o,ɔ/ &gt; [u]</td>
<td>pórt ‘harbor’</td>
</tr>
<tr>
<td></td>
<td>gɔs ‘dog’</td>
</tr>
<tr>
<td>/i,u/ remain</td>
<td>prɪm ‘thin’</td>
</tr>
<tr>
<td>unreduced</td>
<td>ənəm ‘light’</td>
</tr>
</tbody>
</table>

Again, this reduction phenomenon is similar in many respects to the Bulgarian vowel reduction process: low and mid vowels are eliminated, leaving only vowels that are low in sonority in unstressed position ([i,u,e]). The difference between Catalan and Bulgarian is that the front mid vowels /e,e/ reduce via centralization to [a] in Catalan, whereas in Bulgarian /e/ reduces via raising to [i]. This indicates that preservation of underlying palatality is not as imperative in Catalan as it is in Bulgarian. Instead, Catalan vowel reduction always preserves rounding (/o,ɔ/ > [u]), and also preserves vowel height in cases where this does not require losing rounding /e,e/ > [a]). This system can be generated by demoting the Ident[front] constraint to the bottom of the constraint hierarchy, while ranking Ident[high] to an intermediate position in the hierarchy. This is illustrated in (12):

(12) Constraint Ranking for Catalan

*Unstressed/a
*Unstressed/e,o >> Ident[high] >> *Unstressed/i,u,ɔ
Ident[round] Ident[low]

(13) Sample Tableaux for Catalan /o/

<table>
<thead>
<tr>
<th>/gosás/</th>
<th>Ident [round]</th>
<th>*Unstr.-</th>
<th>*Unstr.-</th>
<th>Ident</th>
<th>*Unstr.-</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>a</td>
<td>e,o</td>
<td>[high]</td>
<td>i,u,ɔ</td>
</tr>
<tr>
<td>ə [gusá]</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>[gosás]</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>[gəsás]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In tableau (13), the high rank of Ident[round] prevents centralization of underlying /o/ to [ə]. Furthermore, the constraint *Unstressed/e,o rules out non-reduction of unstressed /o/. Therefore, the successful candidate is the one in which unstressed /o/ raises to [u]: this candidate avoids a high-sonority vowel in unstressed position, and it does so in a way that preserves underlying rounding. If, however, the unstressed vowel had not been underlyingly round, we would predict a different outcome, as illustrated in the following tableau:
(14) Sample Tableaux for Catalan /e/

<table>
<thead>
<tr>
<th>/serpόta/</th>
<th>Ident [round] * Unstr.-a</th>
<th>* Unstr.-e,o</th>
<th>Ident [high] * Unstr.-i,u,ο</th>
</tr>
</thead>
<tbody>
<tr>
<td>ç' [sɔrpόta]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[sirpόta]</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>[serpόta]</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In tableau (14), we see that the constraint Ident[round] has no effect—the unstressed vowel is not underlyingly round. Instead, the faithfulness constraint Ident[high] decides the day. Reduction via centralization to [ə] is the optimal candidate: it avoids an unstressed vowel that is high in sonority, and it preserves both rounding (vacuously) and vowel height. Note, however, that in both of the tableaux presented for Catalan vowel reduction, there is no reason to maintain *Unstressed/a and *Unstressed/e,o as separate constraints: they could have been combined into a single constraint, or their rankings could have been reversed—neither modification would have affected the outcome in these tableaux. However, when we examine additional data on Catalan vowel reduction, it becomes clear that we must have separate constraints against unstressed low vowels and mid vowels. The pertinent data involve hiatus environments: if application of vowel reduction would result in vowel hiatus between [a] and [ə] (or two schwas), vowel reduction is blocked. I will refer to this phenomenon as hiatus blocking. Data illustrating hiatus blocking are provided in (15):

(15) Catalan Hiatus Blocking (Mascaró 1978):

| [teátrə] | *[tεátrə] | 'theatre' |
| [reeλítət] | *[rεελιτάτ] | 'reality' |
| [meάndɾə] | *[mεάνδρα] | 'meander' |
| [ọstεárik] | *[ọstεάρικ] | 'stearic' |
| [useαnəgrəf] | *[useαnəgrəf] | 'oceanographic' |
| [pεɾunεál] | *[pεɾunεál] | 'tibular' (< perunē + al) |
| [lιnεál] | *[lιnεάλ] | 'linear' (< line + al) |

As illustrated above, unstressed /e/ is allowed to surface unreduced if reduction would otherwise produce an illicit form of vowel hiatus. However, hiatus blocking does not affect unstressed /a/: unstressed /a/ always undergoes reduction, even when it creates an illicit hiatus: cf. [sɔárik] 'Saharan'. (*[saáɾə]). To account for Catalan hiatus blocking, I propose the following constraint:

(16) **Hiatus ([a],[ə]):** A vowel hiatus must contain at least one vowel that is specified for vowel color (vowel color = at least one of (+front, +round)).

By ranking the hiatus constraint between *Unstressed/a and *Unstressed/e,o, the correct results will be derived:
Sonority-Driven Reduction

(17) Analyzing Catalan Hiatus Blocking

<table>
<thead>
<tr>
<th>/saárik/</th>
<th>*Unstr.-a</th>
<th>*Hiatus ([a], [ə])</th>
<th>*Unstr.-e,o</th>
<th>*Unstr.-i,u,ə</th>
</tr>
</thead>
<tbody>
<tr>
<td>saárik</td>
<td>!</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>/teátr/</th>
<th>*Unstr.-a</th>
<th>*Hiatus ([a], [ə])</th>
<th>*Unstr.-e,o</th>
<th>*Unstr.-i,u,ə</th>
</tr>
</thead>
<tbody>
<tr>
<td>teátr</td>
<td>!</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What we see in these two tableaux is that unstressed low vowels are worse than unstressed mid vowels in Catalan: not even the desire to avoid an infelicitous hiatus will induce the language to tolerate an unstressed low vowel, whereas unstressed mid vowels are acceptable under these circumstances. This is encoded grammatically by saying that the constraint *Unstressed/a is more important (higher ranked) than is the hiatus constraint. The multiple-constraint approach to sonority-driven reduction is further supported by the fact that Catalan unstressed /e/ is also subject to hiatus blocking. In hiatus conditions, unstressed /e/ undergoes partial reduction, surfacing as [e]: e.g. /kunřeá/ > [kunřeá] (cf. *[kunřoá]). This indicates that the hiatus constraint must in fact be ranked below *Unstressed/e,ə, as illustrated in tableau (18):

(18) The ranking of *Hiatus([a],[ə]) and *Unstressed/e,ə

<table>
<thead>
<tr>
<th>/kunřeá/</th>
<th>*Unstr.-a</th>
<th>*Unstr.-e,ə</th>
<th>*Hiatus ([a], [ə])</th>
<th>*Unstr.-e,o</th>
<th>*Unstr.-i,u,ə</th>
</tr>
</thead>
<tbody>
<tr>
<td>kunřeá</td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In conclusion, we have seen that the prominence alignment approach is sufficient to account for simple cases of sonority-driven reduction such as that seen in Bulgarian. Furthermore, we saw that the multiple-constraint element of prominence alignment is in fact necessary to account for more complex examples of sonority-driven reduction. The members of the *Unstressed/X family must be inherently ranked such that *Unstressed/a outranks *Unstressed/e,ə (cf. Sri Lankan Portuguese Creole), and constraints must be able to intervene between the members of the *Unstressed/X constraint family (cf. Catalan hiatus blocking).

3. An Alternative Analysis
Anderson (1996) has proposed an alternate analysis for Bulgarian vowel reduction, relying on particle-based vowel representations. In particle-based representations, vowels consist of three basic particles or elements: <I,U,A>.

---

5 The fact that partial reduction is only an option for /e/, and not for /a/ (*[saárik]), indicates that a Max/Dep approach to vowel faithfulness is required: Catalan vowel reduction allows violation of Max[+front] (/e,e/>[ə]), but does not allow violation of Dep[+front] (/a/ cannot surface as [e]).
Different vowel qualities result from different combinations of these particles: [e] is a combination of <A> and <I>, for example. In most particle-based theories, these particles can be combined in various degrees: the combination of <A> plus <I> might have <A> as the dominant quality, or <I> as the dominant quality. The dominant quality is referred to as the “head” element. Anderson (1996) presents the following particle-based representation of the Bulgarian vowel system. In this system, the “head” element in a combination is listed first.

(19) A Particle-Based Analysis of Bulgarian (Anderson 1996)

<table>
<thead>
<tr>
<th>Qualities</th>
<th>Representations</th>
</tr>
</thead>
<tbody>
<tr>
<td>i u e o</td>
<td>&lt;I&gt; &lt;U&gt;</td>
</tr>
<tr>
<td></td>
<td>&lt;A,I&gt; &lt;A,U&gt;</td>
</tr>
<tr>
<td></td>
<td>&lt;&gt;</td>
</tr>
<tr>
<td></td>
<td>&lt;A&gt;</td>
</tr>
</tbody>
</table>

*(w/ slight typographic modifications)*

Using this system of representations, it is quite simple to model Bulgarian sonority-driven reduction as the elimination of the <A> particle from unstressed syllables. For example, eliminating the <A> particle from <A,I> converts underlying /e/ into surface [i], and so forth. The benefit of this approach is that the process used to eliminate the undesirable vowels is uniform: only particle-deletion is required. However, despite the superficial similarities between vowel reduction in Bulgarian and Sri Lankan Portuguese Creole, the analysis sketched above cannot be straightforwardly extended. Assuming that the low vowels /æ/ and /a/ differ from the mid vowels in terms of headedness, we would have the following particle-based representation of the Sri Lankan vowel system:

(20) Extending the Particle-Based Analysis to Sri Lankan

<table>
<thead>
<tr>
<th>Qualities</th>
<th>Representations</th>
</tr>
</thead>
<tbody>
<tr>
<td>i u e o æ a a</td>
<td>&lt;I&gt; &lt;U&gt;</td>
</tr>
<tr>
<td></td>
<td>&lt;I,A&gt; &lt;&gt; &lt;U,A&gt;</td>
</tr>
<tr>
<td></td>
<td>&lt;A,I&gt; &lt;A&gt; &lt;A,U&gt;</td>
</tr>
</tbody>
</table>

To derive the Sri Lankan vowel reduction phenomenon, we must prohibit the particle <A> from occurring in head position of an unstressed syllable. Although reduction of /a/ to [ə] would still be modeled as deletion of an <A>-particle, reduction of unstressed /æ/ to [e] is not a case of particle deletion, but a case of headedness reversal. Therefore, two different, ranked processes are needed.

(21) Condition: <A> cannot be the head element in an unstressed vowel

\[
<A,x> \rightarrow <x,A> \quad \text{(headedness reversal)}
\]

\[
<A> \rightarrow <∅> \quad \text{(A>-deletion)}
\]

Similarly, the particle-based approach has difficulty representing the partial reduction of unstressed /e/ to [e] in Catalan hiatus environments, since particle-based theories usually represent the tense–lax distinction by giving something
extra to the tense qualities (i.e., tense vowels might be headed, while lax vowels are headless; tense vowels might have an additional <l> particle that lax vowels lack). This being the case, the /e/ to [e] reduction would have to be formally modeled as an augmentation rather than a reduction. In summary then, although the particle-based approach offers a more elegant, unitary-process analysis of simple cases of sonority-driven reduction, examinations of more complex cases require a heterogeneous class of processes to be admitted. Although these processes are formally dissimilar (i.e., ranging from deletion, to reversal, to augmentation), they are functionally similar: they all decrease sonority. In fact, this approach can almost be considered a notational variant of the Optimality-Theoretic analysis provided above. The main difference is that under the particle-based approach, vowel sonority is encoded in vowel representations. In the Optimality-Theoretic approach, vowel sonority is encoded in phonetically-based prominence constraints.

4. Conclusion: Maximizing Sonority-Stress Combinations

The fact that prominence alignment is the motivation behind sonority-driven reduction is an interesting finding since it fills in the final slot in the typology of possible interactions between stress and sonority, as predicted by the prominence alignment hypothesis. That is, if a language maximizes prominence by aligning stress and sonority, there are two parameters that can be varied, each of which has two values. The first parameter is the type of element to be targeted for special attention: high prominence elements or low prominence elements. The second parameter is the phonological entity that can be modified: stress or vowel quality (sonority). Taking Kenstowicz’ (1994) examples of sonority-driven stress as a starting point, we can see that all sonority-driven stress systems keep vowel quality (sonority) static, but they do modify stress placement. However, with respect to the position that is singled out for special attention, two different categories of sonority-driven stress are observed: those that concentrate on high prominence elements (requiring high-sonority vowels be stressed, cf. Kobon) and those that concentrate on low-prominence elements (requiring that low-sonority vowels be unstressed, cf. Northwest Mari). This is illustrated in the first row of the following table (22):

(22) Maximizing Stress/Sonority Combinations: A Brief Typology

<table>
<thead>
<tr>
<th>Modify Stress</th>
<th>Focus on High Prominence</th>
<th>Focus on Low Prominence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High sonority vowels attract stress placement (Kobon)</td>
<td>Low sonority vowels repel stress placement. (NW Mari)</td>
</tr>
<tr>
<td>Modify Sonority</td>
<td>Stressed low sonority vowels undergo sonority increases (Chamorro, Crosswhite 1998)</td>
<td>sonority-driven reduction: unstressed high-sonority vowels undergo sonority reduction</td>
</tr>
</tbody>
</table>

As shown in the second row, it is also possible to maximize stress-sonority combinations by keeping stress placement static and modifying vowel quality (sonority). Again, there are two different categories of this phenomenon: those that focus on high prominence elements (i.e., stressed positions) and those that focus on low prominence elements (i.e., unstressed positions). As shown, three of
the categories predicted by this typology are already attested. The attestation of sonority-driven reduction completes this typology.

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Distributed (and Dissolved) Pragmatics

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0. Introduction
Pragmatics has traditionally and generally been viewed as a performance-based post-grammatical filtering device (see Levinson 1986). An explicit designation of pragmatics as a post-grammatical filter is seen in Gazdar and Klein (1977) who treat it as a kind of ‘surface filter’, taking effect post-grammatically. Such a position seems to be justified to the extent that the traditional distinction between ‘competence’ and ‘performance’ can be maintained. Thus an infamous example like

*Colorless green ideas sleep furiously* is a grammatical sentence competence-wise but will be deviant performance-wise.

Or is it? Though the point goes through with the Chomsky sentence, this seems to be only part of the entire picture regarding pragmatics’ status as a performance-based filter. A filter-oriented pragmatic approach becomes problematic if what is deemed to be pragmatic turns out to have significant bearing on the workings of the ‘core’ grammar. The term ‘pragmatics’ here means “the study of language in a human context of use” (a preliminary definition given by Mey (1999b): 724)\(^1\). But linguistic matters attributed to a human context of use are not necessarily uniform in quality. As shown in the rest of this paper, subsuming them uniformly under the traditional notion of performance is implausible.

This paper proposes **need-based pragmatics**: inclusion of (or reference to) pragmatic information in grammar is effected only if *independently* required by grammar. Pragmatics (as a linguistic component if conceived as such\(^2\)) is distributed over (a) grammatical and (b) non-grammatical domains. The former encompasses, among other things, lexical **conventional implicatures** and lexically underspecified grammatical features the values of which are to be determined

---

\(^1\) This definition is revised by Mey to “the study of language from a user point of view, where the individual components of such a study is joined in a common, social perspective” (p. 725). Since, as Mey notes, this retains a user context as a central notion, I assume the simpler preliminary definition.

\(^2\) Kasher (1998) clearly states that pragmatics is not a module. The author includes in pragmatics (a) deixis, (b) lexical pragmatic presuppositions, (c) forces of speech acts, (d) performatives, (e) conversational implicatures, (f) talk in interaction, and (g) politeness principles.
contextually. The latter is absorbed by an inferential system of socio-cultural interactions and includes, inter alia, CONVERSATIONAL IMPLICATURES (Grice 1975). What is attempted here is a re-negotiation on the boundary between competence and performance in such a way that the reference to context of use per se does not demarcate the boundary automatically. The two traditional notions are replaced with (a) the GRAMMATICAL PROCESS(OR) and (b) the COMMUNICATIVE PROCESS(OR), respectively, corresponding to what Green (1982) calls ‘knowledge of language’ and ‘knowledge about language.’ This move is not just cosmetic. The former, the focal point of this paper, deals with FORMAL (phonology, syntax, and semantics) aspects of language regardless of the role played by context. The latter, not discussed here (see Green (1982)), forms a complement set of the former.

1. **Context and grammar**

Among numerous examples of lexically coded contextual aspects that are significant for grammar, we find focus, e.g. English lexical items like *even* and *only*. Focus, as a conventional implicature, is known to influence truth conditions (Rooth 1985). In a context where the speaker introduced Bill and Tom to Sue, and no other introductions took place, (1a) is false but (1b) is true.

1. (a) I only introduced BILL to Sue

   b. I only introduced Bill to Sue (Rooth’s (3a, b): p. 3)

Grammatically relevant focus information also arises non-lexically from a context of use captured by Engdahl and Vallduví (1996) as INFORMATION STRUCTURE—an updateable information state encompassing FOCUS and GROUND which is independent from a truth conditional dimension of meaning. According to Engdahl and Vallduví, there is a strong correlation between information structure and prosody (i.e. phonology) in English-type languages on the one hand and between information structure and word order (i.e. syntax) in Catalan-type languages.

Penetration of pragmatics into grammar is seen even in the most recent version of transformational grammar, the minimalist program (Chomsky 1995). Uriagereka’s (1998: 237) ‘topic feature’ triggering topicalization is a lexically specified pragmatic feature—after all topicality is a pragmatic notion par excellence. Topic here is a functional feature which is to be syntactically checked by an element that agrees with it along the lines of a derivation seen in (2). (I eschewed movement viewed as ‘copy & delete’.)

2. (a) [Comp [Comp [Comp Top] [I dislike [Top this government]]]]

   b. [Comp [Top this government]k [Comp [Comp Top] [I dislike t_k]]]

For such an account, we need an abstract functional feature hosted in some functional head as well as some lexical designation of topicality for whatever lexical element that gives rise to topichood. This choice is forced, as described below in
more detail, due to the framework’s commitment to the competence-performance distinction. Lexical designation of topicality is easy for a language like Japanese where the topic marker -wa exists\(^3\) but not very straightforward for a language like English where topicality is indicated by word order. Treating topicality in English as a lexical property strikes me as awkward at best. The account like Engdahl and Valduví (1996) mentioned above where topicality can be derived from a context of use seems to be a more plausible method.

As examples of lexically underspecified contextual aspects, I will introduce the referential properties of Japanese ‘social role terms’ (kin and occupational expressions) seen in (3a) (SRTs hereafter; see Suzuki’s (1974) socio-pragmatic descriptions on their use\(^4\)). SRTs constitute the central evidence of this paper.

With regard to SRTs which show a high degree of deictic flexibility, we observe instances of underspecified but grammatically relevant features (person/number/gender). As in (3b) below, a (normally) 3rd person lexical item, sensei ‘teacher’, can be used to signify 1st (3b") or 3rd person (3b') depending on the availability of a proper context. We note that the initial NPs in (3b, c) are nominative not vocative, qualifying it for a grammatical subject.

(3) a.okaasan ‘mother’ otoosan ‘father’, sensei ‘teacher’, omawaran ‘police officer’, etc.

b. Sensei-ga odor-u(-zo)
teacher-NOM dance-PRES(-EMPHATIC)
(b’) ‘The teacher (s/he) dances!’ (no special context)
(b") ‘The teacher (I) dances!’ (SPEAKER referring to SELF)

c. Sensei-ga utatte-kudasai-
teacher-NOM sing-REQUEST-PRES
‘The teacher (you), please sing!’ (SPEAKER referring to ADDRESSEE only)

Moreover, (3c) is a striking example where the same word can be neither 1st nor 3rd and is forced to be exclusively 2nd person due to the speech act property of the sentence, namely a request.

\(^3\) See Fukushima (1999) for a lexical treatment of topicalization in Japanese which remedies shortcomings of transformationally oriented accounts. This lexical approach is interesting in the present context due to its demonstration about the effect of pragmatics on lexical rule applications (i.e. a matter of grammar). It is shown that the presence of a purely pragmatic argument of some predicate (e.g. a topic NP) prevents a certain type of lexical rule application to that predicate.

\(^4\) In a nutshell, SRTs can be used in the following fashion. (a) As non-self addressing/referring terms for people who are socially (age/status-wise) superior to SELF: e.g. you can call your father otoosan ‘father’ but cannot call your daughter musume ‘daughter.’ (b) As self addressing/referring terms when conversing with addressees who are socially inferior to SELF: e.g. you can call yourself otoosan ‘father’ when talking to your daughter but cannot call yourself musuko ‘son’ when you talk with your mother.
2. Against pragmatics as a post-grammatical filter

Viewed from a perspective of real-time language use (especially comprehension), SRTs seen above render a grammar with filter-oriented pragmatics to be either lexically quite redundant or grammatically (i.e. representationally/operationally) inefficient and superfluous. To demonstrate this point, let us take the PRINCIPLES AND PARAMETERS (P&P) model (Chomsky and Lasnik 1995)\(^5\) as an example.

Due to its strong commitment to modularity and information encapsulation, P&P, just as its transformational predecessors (Chomsky 1981; 1986), allows overgeneration and supports strict traditional segregation between competence and performance. In P&P, a linguistic structure is built *step by step* and completed after the progression from an underlying structure to a surface one. Syntax, semantics, and phonology are the ‘core’ areas of encapsulated grammar where linguistic information flows uni-directionally from ‘generative’ syntax to ‘interpretive’ semantics and phonology. No provision (other than lexical designations) is made for the incorporation of contextual information into the workings of grammar. In such a model, then, pragmatics (if it were to play a role) would take a backseat and be relegated to a post-grammatical filter\(^6\).

2.1. Massive lexical redundancy

For a grammar like P&P with a (presumed) pragmatic filter, if no feature underspecification is assumed (see below), an SRT like *sensei* ‘teacher’ (and numerous others) must have at least three lexical entries differing, for example, only in person. If we consider number (needed for quantification and reflexive agreement; see below) and gender (needed additionally for reflexive agreement; see below), superfluous lexical redundancy of this sort becomes simply overwhelming.

2.2. Representational/Operational inefficiency

If SRTs are to be underspecified for person/number/gender, then filter-oriented pragmatics would make syntax-semantics non-parsimonious. This point is demonstrated based on the following four facts in Japanese: (1) quantification, (2) *wh*-structures, (3) reflexive agreement, and (4) compound formation.

2.2.1. Quantification

SRTs’ effect on quantification is shown in (4). Only when *sensei* is 3rd and plural, (4a) is scope ambiguous as indicated in (4b, c). Due to underspecification of feature values and the fact that the actual person value is unknown pre-pragmatically, it is necessary, on the one hand, to tentatively construct (with QR) and retain both (a) an LF structure with wide scoped *sensei* (5a), and (b) another with narrow scoped

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\(^5\) As long as the traditional opposition between competence and performance is maintained, arguments made here will apply to any grammatical theory.

\(^6\) As Levinson (1983) notes, however, designation of pragmatics as a post-grammatical filter is viable only if a systematic pragmatics already exists. Otherwise counter examples for a grammatical theory would be attributed to presumed pragmatic factors in an ad hoc way.
Distributed (and Dissolved) Pragmatics

\textit{sensei} relative to \textit{dareka} ‘someone’ (5b). On the other hand, at least one scope-insensitive counterpart like (5c) is needed. Only one of these two possibilities will be relevant when actual person and number values are made available\footnote{Since two co-occurring existential quantifiers do not effect scope ambiguity, we ignore other possible LF structures where \textit{sensei} signifies ‘some teacher’}.

(4) a. Sensei-ga dareka-o sikat-ta
    teacher-NOM someone-ACC scold-PAST
    ‘The teacher/a teacher/(the) teachers/I/You scolded someone’

b. There are teachers such that they scolded a (possibly distinct) person.

c. There is an individual such that teachers scolded him/her.

(5) a. $[s \text{ teachers}_i [s \text{ someone}_j [s t_i \text{ scolded } t_j ]]]$

b. $[s \text{ someone}_j [s \text{ teachers}_i [s t_i \text{ scolded } t_j ]]]$

c. $[s \text{ someone}_j [s \text{ TEACHER scolded } t_j ]$ (with \text{TEACHER} = \text{the teacher, I, or you})

If only one derivation/representation is to be constructed deterministically by the grammar, then looping back from pragmatics to syntax will be necessary.

2.2.2. \textit{Wh}-structures
Continuing with underspecification of grammatical features, if no looping from pragmatics to syntax is supposed, there has to be a tentative derivation for either of (6a, b) pre-pragmatically treating it as a legitimate \textit{wh}-sentence (with \textit{wh}-movement in s-structure (Watanabe 1992) or in LF (Huang 1985)) just in case \textit{sensei} turns out to be 3rd post-grammatically.

(6) a. Dono \textit{sensei-ga} utat-ta-ka
    which teacher-NOM sing-PAST-Q
    ‘Which teacher sang?’

b. Sensei-ga dotira-no \underline{gakusei-o} suisensu-ru-ka
    teacher-NOM which-GEN student-ACC recommend-PRES-Q
    ‘Which student does the teacher recommend?’

But, if the person value for the SRT, say 2nd, were already available in syntax, \textit{dono sensei} ‘which teacher’ would immediately disqualify as a \textit{wh}-NP: c.f. *dono anata ‘which you’. There will be no further syntactic consideration needed, let alone \textit{wh}-movement.
2.2.3. Reflexives
We observe that in (7a) sensei is 3rd, masculine, and singular for the reflexive kare-zisin ‘himself’ but in (7b) it must be 1st, masculine, and singular for boku-zisin ‘myself’.

(7) a. Sensei-ga kare-zisin-o home-ta(-noda) teacher-NOM he-self-ACC praise-PAST(-DEC)
   ‘The teacher (he) praised himself’ (no special context)

b. Sensei-ga boku-zisin-o home-ta(-noda) teacher-NOM I\textsubscript{masse}-self-ACC praise-PAST(-DEC)
   ‘The teacher (I) praised myself’ (SPEAKER referring to SELF)

These facts will receive a non-uniform account in P&P with a pragmatic filter. First, syntax has to establish configurational prerequisites (e.g. the c-command condition, etc.) for binding. Second, person/gender/number feature value agreement between the antecedents and reflexives needs to be examined by pragmatics.

2.2.4. Compounds
The underlined SRTs in compound nouns seen in (8) are exclusively 3rd. If feature underspecification for SRTs is to be retained, P&P with a filter-oriented pragmatics has to suppose a special and arbitrary lexical statement/rule making the person value 3rd for the SRTs participating in compound formation. Such an idiosyncratic and context specific rule is highly suspect. (See section 4 for some discussion on the importance of the person value of a non-head component of a compound.)

(8) a. okaasanko ‘mother.child (i.e. child attached to a mother)’

b. onawarisan nakase ‘police officer cry.CAUS (i.e. annoyance to a police officer)’

2.3. Summary
With SRTs in Japanese, it has been demonstrated that there are indeed important grammatical features the values of which are lexically underspecified but necessary for adequate descriptions of grammatical phenomena. Inability to access grammatical feature values for person, number, gender that are contextually determined renders a grammatical theory like P&P with a pragmatic filter lexically highly redundant and/or grammatically inefficient and superfluous. Under the current analysis proposed below, the problems are resolved simply as automatic consequences of the theoretical architecture assumed.

3. A monotonic account of social role terms
Though any monotonic/monostratal framework would be able to offer an adequate account for the facts seen above, we assume HPSG (Pollard and Sag (P&S) 1987/1994; Sag 1997; Levine and Green 1999) here. HPSG represents lexical and non-lexical
linguistic signs as a collection of ATTRIBUTE-value pairs that are grouped into PHONOLOGY and SYNESEM. The latter further divides into CATEGORY (syntax), CONTENT (semantics), and CONTEXT (pragmatics). In contrast to P&P, there is no directionality of an information flow between different ‘components’ of grammar and, for example, information in CONTEXT is accessible from any other components and vice versa. Among the items crucial for this paper, we count (a) CATEGORY with, among other things, part of speech information and ARG[ument]-ST[ucture] attribute indicating valence of predicates, (b) CONTENT including INDEX with PER[son], NUM[ber], GEND[er], etc. for nouns, and (c) CONTEXT encompassing C[ontextual]-INDICES which includes SPEAKER and ADDRESSEE.

Various universal and language specific constraints simultaneously regulate co-occurrence of signs that share information via structure sharing. Thus, contextual information, if deemed relevant, can play an active role in the GRAMMATICAL PROCESSOR.

3.1. Basic facts
Unlike pronouns such as kanozyo ‘she’ or kare ‘he’, SRTs like sensei ‘teacher’ are lexically given a ‘defeasible’ default PER value ‘/3rd’\(^8\) (after Lascarides et al. 1996): i.e. kare: NP[PER 3rd] vs. sensei: NP[PER /3rd]. Pronouns must be referentially rigid or they would disrupt communication totally. Over-riding the default, however, the universal constraints on feature structures (9a, b) force any NP identified with the speaker or addressee to be 1st or 2nd person, respectively.

\[
\begin{align*}
\text{(9) a.} & \quad \left[ \begin{array}{c}
\text{CATEGORY NP} \\
\text{CONTENT}[\text{INDEX [1]}[\text{PER } ] \\
\text{CONTEXT}[\text{C-INDICES [SPEAKER [1]}] \\
\end{array} \right] & \Rightarrow & \left[ \begin{array}{c}
\text{CATEGORY NP} \\
\text{CONTENT}[\text{INDEX [1]}[\text{PER 1st} ] \\
\text{CONTEXT}[\text{C-INDICES [SPEAKER [1]}}] \\
\end{array} \right] \\
\text{b.} & \quad \left[ \begin{array}{c}
\text{CATEGORY NP} \\
\text{CONTENT}[\text{INDEX [1]}[\text{PER } ] \\
\text{CONTEXT}[\text{C-INDICES [ADDRESSEE [1]}}] \\
\end{array} \right] & \Rightarrow & \left[ \begin{array}{c}
\text{CATEGORY NP} \\
\text{CONTENT}[\text{INDEX [1]}[\text{PER 2nd} ] \\
\text{CONTEXT}[\text{C-INDICES [ADDRESSEE [1]}}] \\
\end{array} \right]
\end{align*}
\]

This accounts for (3b'', c) above. If none of (9a, b) holds due to the lack of relevant context, sensei will be defaulted to NP[PER 3rd] giving rise to (3b’).

At this point, some readers might wonder whether P&P plus a pragmatic filter can be improved to offer a better account than what was described in the previous section, only if we assume the same kind of default. Unfortunately, this is not the case. To avoid inadequacies pointed out above, P&P needs the person (and number/gender) feature specified one way or the other during the syntactic computation. Since pragmatics is post-grammatical, an underspecified person feature will always end up being 3rd at the end of syntax. This leaves no room for an SRT like sensei to be 1st or 2nd failing to account for (3b'', c). What is needed is a pragmatic rule that

\(^8\) For SRTs, it is also assumed that the NUM attribute has a defeasible default value ‘/sing’ and the GEN attribute is specified as ‘/neut’. The discussion in the text, however, focuses on PER values for expository simplicity for the most part.
rewrites feature values, but the plausibility and adequacy of such a powerful rule are questionable.

3.2. Quantification

Without tentative multiple representations, the relevant scope-sensitive and ambiguous interpretations and scope-insensitive interpretations become available for (4a) above. With a relevant context (9) or the default, along with other general principles of HPSG, renders the PER and NUM values of sensei accordingly. For example, if the NP is [PER 3rd; NUM pl], then interpretations corresponding to (5a, b) (repeated here as (10a, b)) are obtained.

(10) a. \([S \text{ teachers}, \ S \text{ someone}, \ S \ t_i \ scolded \ t_j]\)

b. \([S \text{ someone}, \ S \text{ teachers}, \ S \ t_i \ scolded \ t_j]\)

c. \([S \text{ someone}, \ S \text{ TEACHER scolded} \ t_j]\) (with TEACHER = the teacher, I, or you)

Though narrowing down to one of (10a, b) will depend on further contextual elaboration and the workings of the COMMUNICATIVE PROCESSOR not considered here, we at least eliminated the scope-insensitive readings (5c) (repeated as (10c)) from further consideration. (10a), for example, will be analyzed as (11a). (11b, c) are AVMs corresponding to the quantificational NPs sensei ‘teachers’ and dareka ‘someone’, respectively. (‘CARD’ is a cardinality function on sets.)

(11) a. \[
\begin{align*}
\text{QUANTS} & \langle 3, 4 \rangle \\
\text{NUCLEUS} & \text{RELATION scold} \\
\text{QSTORE} & \{ \} \\
\text{RETRIEVED} & \langle 3, 4 \rangle
\end{align*}
\]

b. \[
\begin{align*}
\text{DET} & \text{ exists} & \text{& CARD(5)} \geq 2 \\
\text{INDEX} & [1] \\
\text{RESTIND} & \text{RESTR} \{ \\
\text{QUANTS} & \langle \rangle \\
\text{NUCLEUS} & \text{RELN [5] teacher} \\
\text{INST} & [1] \}
\end{align*}
\]

c. \[
\begin{align*}
\text{DET} & \text{ exists} \\
\text{INDEX} & [2] \\
\text{RESTIND} & \text{RESTR} \{ \\
\text{QUANTS} & \langle \rangle \\
\text{NUCLEUS} & \text{RELN person} \\
\text{INST} & [2] \}
\end{align*}
\]

The analysis here assumes the SEMANTIC PRINCIPLE (final version) of P&S (1994) which divides a sentence into two main components: (1) a list of quantifiers (QUANTS)
reflecting scope relations between multiple quantifiers and (2) a quantifier-free predi
cative core (NUCLEUS). QSTORE and RETRIEVED attributes are in a set comple
ment relation and, a la Cooper (1983), indicate if a given quantifier has already been scoped or not.

3.3. *Wh*-structures
The problem concerning *wh*-structures seen in (6) above are handled simply as a matter of lexical compatibility between a *wh*-determiner like *dono* ‘which’ and its N’ sister. Whether or not Japanese has so called ‘*wh*-movement’ needs not to be considered. If it turns out that there is indeed *wh*-movement (not merely ‘scram
bling’ of *wh*-phrases) in Japanese, an account is readily available in HPSG.

The *wh*-determiner *dono* has the following lexical entry.

(12)  

\[
\text{PHONOLOGY} < \text{*dono*} >  
\text{SYNSEM} \text|LOC} \left[ \text{CATEGORY} \left[ \begin{array}{c}
\text{HEAD}_{\text{det}}[\text{SPEC N'}[\text{CONTENT}][\text{PER 3rd}]] \\
\text{SUBCAT} < > \\
\text{CONTENT} ...
\end{array} \right] \right]
\]

An NP like *dono* *sensei* ‘which teacher’ is a *head-marker* structure in which the marker *dono* syntactically selects the head N’ that is [PER 3rd]. This means that any instance where an SRT has a non-default PER value would disqualify as a possible *wh*-NP.

3.4. Reflexives
The current account offers a simpler solution for (7) since binding and accessing of contextual information are achieved simultaneously. With no special context, *sensei*-ga in (7a) will be NP[PER 3rd; NUM sing] (a default) which can antecede *kare-zisin*. Due to (9) and the context given, the same NP is [PER 1st; NUM sing], hence a legitimate antecedent of *boku-zisin* in (7b).

Following P&S’s BINDING THEORY, a simplified analysis for (7b) is given in (13) where NP[1] and NP[2] correspond to *sensei* ‘teacher’ and *boku-zisin* ‘I,masc,-
sel’, respectively.

(13)  

\[
\text{NON-HD-DTRS}<  
\text{HD-DTR} \left[ \text{CONTENT} \text|\text{INDEX} [1][\text{PER 1st}; \text{NUM sing}] \right]\right. 
\text{PHONOLOGY} \text{home} \text{a} 
\text{CATEGORY} \left[ \begin{array}{c}
\text{V} [\text{ARG-S}<\text{NP}[1], \text{NP}[2]>] \\
\text{RELATION} \text{praise} \\
\text{PRAISER} [1] \\
\text{PRAISEE} [2]
\end{array} \right] \right. 
\text{NON-HD-DTRS}<\text{NP}_{\text{ana}}[2]>
\]

We notice that, in accordance with HPSG’s Principle A, the anaphor *boku-zisin* is LOCALLY O-BOUND by the antecedent *sensei* which LOCALLY O-COMMAND the anaphor. (‘O-’ stands for OBLIQUENESS of grammatical relations with the subject

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being least oblique.) This holds since the two NPs are co-arguments of the predicate *hometa* ‘praised’ and the antecedent *sensei* is less OBlique than the anaphor *boku-zisin*.

### 3.5. Compounds

It is recalled that SRTs in compounds like (8) (repeated here as (14)) are strictly [PER 3rd].

(14) a. *okaasanko* ‘mother.child (i.e. child attached to a mother)’

b. *omawarisan nakase* ‘police officer cry.CAUS (i.e. annoyance to a police officer)’

According to the current approach, this is just an automatic consequence of (a) the lexical default, and (b) LEXICAL INTEGRITY which is a highly plausible and independently motivated assumption. For example, after *okaasanko* is formed in the lexicon, lexical integrity prevents the PER value of the SRT *okaasan* from being altered one way or the other from the ‘outside.’ But thanks to the default, it will end up being 3rd. We do not need a highly specialized feature-value-altering rule to account for these cases that P&P plus a pragmatic filter has to assume. Such a rule, however, will violate lexical integrity, if applied post-lexically.

Some readers may question the necessity of specifying the PER value of a non-head component of a compound. This is indeed necessary. For one thing, a compound expression like *okaasanko* cannot be used, for example, to indicate the speaker’s child in the same way *wagako* ‘my.child’ can. Also there are compounds like *anata-gonomi* ‘you.preference (i.e. a favorite (type/person) of the addressee)’ the pronoun in which cannot be used to indicate the speaker or the third party. Thus, though an SRT or pronominal is a non-head element of these compounds, their PER values have an important role to play in interpreting the compound as a whole.

### 3.6. Summary

The grammatical facts surrounding SRTs in Japanese are shown to be simple consequences of the grammatical architecture assumed (HPSG). There is no need for massive lexical redundancy or superfluous grammatical representations/operations. The GRAMMATICAL PROCESSOR’s reference to contextual information (in C-INDICES) is justified (or necessitated) due to the fact that the formal grammar of quantification, *wh*-sentences, reflexive binding and agreement, and compound formation in the language call for it independently.

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9 The term ‘indicate’ here does not mean ‘refer’ because, due to lexical integrity, a non-head component of a compound constitutes an anaphoric island.
4. Discussion and concluding remarks

This paper reviewed the adequacy of the traditional distinction between competence and performance revealed through the designation of pragmatics as a post-grammatical filter. The central issue was the treatment of grammatically significant contextual information. It is suggested that the boundary between the two traditional notions should be re-drawn, as the distinction between the GRAMMATICAL PROCESSOR and the COMMUNICATIVE PROCESSOR, based on grammatical/formal necessity of such contextual information. This in effect, brings about re-distribution of pragmatic information and dissolution of pragmatics as a linguistic component.

The opposition between the GRAMMATICAL PROCESSOR and the COMMUNICATIVE PROCESSOR is interesting in the context of some recently developed UNIFICATION-BASED MONOTONIC GRAMMARS (Pollard and Sag 1987/1994; Engdahl and Vallduví 1996; Sag 1997; Fillmore and Kay 1999, etc.) which argue and open up the possibility for the inclusion of pragmatic information in grammatical descriptions. Though such a development is a realistic and positive move, it leaves matters open concerning how much and what kind of pragmatic information should be part of grammatical descriptions. After all an AVM—linguistic structural representation—in HPSG, for example, can include, in principle, any pragmatic information in its CONTEXT attribute. The answer offered by this paper to the open question is that it is not so much the presence or absence of pragmatic information in a structural representation per se as the nature of the two processors (the GRAMMATICAL PROCESSOR and the COMMUNICATIVE PROCESSOR) operating on a structural representation that is significant in discriminating formally relevant/irrelevant pragmatic information. What is allowed by the GRAMMATICAL PROCESSOR is well-formed and pragmatic filtering of well-formed sentences is unnecessary.

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Re-examining Default-to-opposite Stress

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0. Introduction
Default-to-opposite stress has attracted ample attention in the phonological literature (e.g., Prince 1983; Halle and Vergnaud 1987; Hayes 1995; Walker 1996; Zoll 1997; Bakovic 1998, etc.). In default-to-opposite stress systems, the stress-attracting edge in a domain, typically the word, differs as a function of the weight of syllables found in the domain. Default-to-opposite stress systems thus assume one of two forms. Many languages with default-to-opposite stress place stress on the rightmost heavy syllable, otherwise on the leftmost syllable in words with only light syllables. Another group of default-to-opposite stress systems stress the leftmost heavy syllable, otherwise the rightmost syllable in words with only light syllables. In the former case, the default side is the left side, since it is the left side of the word which attracts stress in the absence of heavy syllables. In the latter case, the default side is the right side, since it is the right side which attracts stress if there are no heavy syllables.

Krueger’s (1961) account of Chuvash stress describes a default-to-left stress pattern, in which stress falls on the rightmost heavy syllable (=Full vowels), otherwise the initial syllable, as in (1).

(1) Chuvash stress (forms from Krueger 1961)
Rightmost heavy (=Full vowels): sarla’ka ‘widely’, la’ja ‘horse’
Otherwise, leftmost: ʼəs’ləpər ‘we shall work’, ʼtətəmər ‘we got up’

Kwakw’ala (Boas 1947; Bach 1975; Wilson 1986) is typically described as a language with a default-to-right stress system, in which the leftmost heavy syllable (=CVV, CVR [R=sonorant]) attracts stress, otherwise the final syllable, as in (2).

(2) Kwakw’ala stress (forms from Bach 1975)
Leftmost heavy (=CVV, CVR): ‘xʷəxʷəxʷəxəna ‘canoe (pl.)’, tʼəliːdzu ‘large board on which fish are cut’, təlqʷa ‘soft’, məxənənd ‘to strike’
Otherwise, rightmost: tsəxələ ‘to be sick’, gas’xa ‘to carry on fingers’

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1 Thanks to the audience at the 26th meeting of the Berkeley Linguistics Society for helpful comments and suggestions. Any misconceptions or inaccuracies are my own responsibility.
2 The quality of the vowel transcribed here as rounded schwa is contextually determined (see Krueger 1961:71).
This paper re-examines languages analyzed in the theoretical literature as possessing default-to-opposite stress. The principle result is that many, if not all, languages analyzed in the theoretical literature as having default-to-opposite stress are subject to re-analysis in different terms. Many default-to-opposite stress systems turn out to have secondary stresses on heavy syllables not carrying primary stress, a result already noted in the literature for some but not other languages with default-to-opposite stress. In other languages evidence suggests that the stress associated with an edge syllable in words consisting of only light syllables is better analyzed as intonational prominence rather than stress. The general picture which emerges is one of doubt concerning the existence of default-to-opposite stress.

2. A typology of default-to-opposite stress

As a starting point in the investigation of default-to-opposite stress, a list of languages described in the theoretical literature as having default-to-opposite stress was compiled. Sources consulted included Kenstowicz 1994, Hayes 1995, and Walker 1996. A total of eleven languages with default-to-opposite stress were found. In nine of these languages, the default side for stress in words consisting of only light syllables is the left side. In these languages, stress is pulled toward the right edge in words with at least one heavy syllable, and toward the left edge in words lacking heavy syllables. In two languages, the default side is the right side meaning that stress falls on the leftmost heavy syllable, otherwise the final syllable. A list of languages with default-to-opposite stress appears in (2) grouped according to which side is the default side for stress. Primary sources on stress for the cited languages appear in parentheses.

(2) Languages with default-to-opposite stress

**Default-to-left**

- *Khalkha Mongolian* (Street 1963; Bosson 1964; Poppe 1970; Walker 1996)
- *Buriat* (Poppe 1960; Walker 1996)
- *Classical Arabic* (McCarthy 1979; Angoujard 1990)
- *Chuvash* (Krueger 1961; Dobrovolsky 1999)
- *Eastern Mari* (Itkonen 1955; Ristinen 1960; Sebeok & Ingemann 1961)
- *Northwest Mari* (Ivanov & Tuzharov 1970)
- *Huaasteco* (Larsen & Pike 1949)
- *Selkup* (Kuznetsova et al. 1980)

**Default-to-right**

- *Kwakw’ala* (Boas 1947; Bach 1975; Wilson 1986)

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3 Note that Classical Arabic, Northwest Mari, Khalkha and Buriat have a non-finality clause operative in all words of at least two syllables, whereby final stress is either prohibited, as in Northwest Mari (see section 2.2.2), restricted to superheavy syllables (=CVCC, CVV(C)), as in Classical Arabic (see section 2.3.1), or limited to secondary stress and primary stress, only in the case the only heavy syllable is final, as in Khalkha Mongolian and Buriat (see section 2.1.2).
Re-examining Default-to-opposite Stress

A rather striking feature of Table 1 is the predominance of the left side as the default side, an asymmetry to which we will return in section 3. Another feature of most of the default-to-opposite stress languages in Table 1 is their relatively underdocumented status, which leads Halle and Vergnaud (1987:52) to suggest that subsequent investigation may lead to revisions in at least some of their stress descriptions. Since Halle and Vergnaud’s work, further work on certain default-to-opposite stress systems has been published. Given this more recent work, it seems worthwhile to re-examine default-to-opposite stress. To carry out this re-examination, primary sources on the languages in Table 1 were consulted. Interestingly, evaluation of these materials reveals complexities in certain of the default-to-opposite stress systems, some of which have been heretofore undiscussed in the theoretical literature. These complicating factors may be broadly divided into two classes. First, certain languages in Table 1 place secondary stress on heavy syllables not receiving primary stress, a result actually predicted by several metrical stress theories (e.g., Prince 1983; Hayes 1995; Bakovic 1998). These cases are discussed in section 2.1. Second, in other languages, the default stress pattern would appear to be better analyzed as intonational prominence rather than stress; such cases are detailed in section 2.2. Finally, there is a small set of languages discussed in section 2.3 for which stress data is either incomplete or conflicted and neither clearly fits the default-to-opposite pattern nor is clearly amenable to re-analysis in terms similar to those relevant for other default-to-opposite stress systems.

2.1. Secondary stress on heavy syllables

Four languages in the survey were found to have secondary stress on heavy syllables not receiving primary stress. These include Komi Jaz’va, Khalkha Mongolian, Buriat, and Kuuku-Ya’u. Komi Jaz’va is considered in section 2.1.1, Khalkha Mongolian and closely related Buriat are discussed in section 2.1.2, and Kuuku Ya’u is examined in section 2.1.3. A fifth language, Selkup, possibly has secondary stress on heavy syllables without primary stress, although the data is inconclusive (section 2.1.4).

2.1.1. Komi Jaz’va

Itkonen (1955) describes a default-to-opposite stress system in the Jaz’va dialect of Komi (Uralic) whereby the leftmost heavy syllable (=etymological non-high non-vowels⁴) attracts stress in words containing at least one heavy syllable, and the rightmost heavy syllable attracts stress in words consisting only of light syllables. Recent work by Hausenberg (1998), however, suggests that all heavy stem syllables are stressed, though no claims are made about the location of primary stress. Hausenberg’s account allows for a different characterization of the Komi Jaz’va stress system which is not directly default-to-opposite. We may say that stress falls on heavy syllables in words containing at least one heavy syllable, otherwise on the final syllable in words lacking heavy syllables, and that the leftmost stress is the primary one. Alternatively, we might state that primary stress falls on the leftmost heavy syllable, otherwise on the rightmost syllable in words lacking heavy syllables, and that secondary stress falls on heavy syllables not carrying primary stress. Regardless of the prose formulation of the Komi Jaz’va stress rule, it is crucially only primary stress which is default-to-opposite.

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⁴ Subsequent processes have turned certain historically non-high vowels into high vowels synchronically; these new high vowels behave as heavy for stress.
2.1.2. Khalkha Mongolian and Buriat

Bosson (1964) and Poppe (1970) describe a potential default-to-stress pattern in Khalkha Mongolian, an Altaic language. According to their descriptions, stress falls on the rightmost non-final heavy syllable (heavy=long vowels and diphthongs), unless the only heavy syllable is final, in which case it attracts stress.5 In words with only light syllables stress falls on the initial syllable.

Works by Street (1963) and Walker (1996) suggest a slight modification of this analysis. Walker’s account is as follows. As in Bosson’s and Poppe’s analyses, primary stress falls on the rightmost non-final heavy syllable and on the final syllable if it is the only heavy syllable. In words containing only light syllables, the only stress is on the initial syllable, again as in earlier analyses. Walker’s account (and Street’s also) differs in positing secondary stress on heavy syllables not carrying primary stress, as well as on the initial syllable, though she expresses some uncertainty about the initial secondary stresses. Words illustrating Khalkha stress in Walker’s account appear in (3)

(3) Khalkha stress (forms from Walker 1996)

Multiple heavy syllables (at least one is non-final): 'a:ru: 'dry cheese curds', 'uitgar:tae 'sad', 'do:lo:du,ga:r 'seventh', 'xøn,di:'ry:len 'to separate (modal), u,lan'bata:ra's 'Ulaanbaatar (ablative)

Only heavy syllable is final: 'da:lae 'sea', ga'lu: 'goose'

All light syllables: 'axa 'brother', 'unšis'an 'having read'

Just as in Komi Jaz’va, the presence of secondary stress on heavy syllables not carrying primary stress turns Khalkha stress into a limited default-to-opposite stress system only for primary stress. In addition, if one assumes that the secondary stresses on initial light syllables are genuine, this means that the initial syllable always carries either primary or secondary stress, another aspect of Khalkha stress which deviates from a true default-to-opposite stress pattern. Buriat (Poppe 1960; Walker 1996), an Altaic language closely related to Khalkha, is reported by Walker to have an essentially identical stress pattern to that of Khalkha.

2.1.3. Kuuku-Ya’u

Kuuku-Ya’u is an Australian language described by Thompson (1976, 1988) as having a stress system very similar to that of Khalkha with certain minor differences. Primary stress falls on the rightmost heavy syllable (even if final, unlike in Khalkha), where heavy is equivalent to a syllable containing a long vowel. In words lacking heavy syllables, primary stress falls on the initial syllable. The location of secondary stress is sensitive to various complexities not all of which are instantiated in the forms cited by Thompson. The crucial aspect of secondary stress for present purposes is the presence of secondary stress on heavy syllables lacking primary stress. The Kuuku-Ya’u stress system thus shares with Kalkha and Komi Jaz’va its confinement of default-to-opposite stress to primary stress.

5 Bosson and Poppe actually say that a penultimate heavy syllable is stressed and, in all of their examples with multiple heavy syllables, the penult is heavy. As Walker (1996) points out, this wording of the stress rule is ambiguous between rightmost non-final heavy or second-to-last of the heavy syllables. Walker (1996) shows that the former characterization, rightmost non-final heavy, is correct.
2.1.4. Selkup
Of the languages discussed thus far, the Selkup data appears to be the most
inconclusive. Kuznetsova et al. (1980) present a default-to-opposite analysis of
Selkup stress, according to which the rightmost heavy syllable (=long vowels) is
stressed, otherwise the initial syllable in words lacking heavy syllables, subject to
certain morphological complications. However, they also suggest that the location of
stress is variable, and there are instances of words with multiple stresses, for which it
is often unclear which stress is primary. In particular, their data for which multiple
stresses are marked (pg. 37) suggests a propensity for stressing all heavy syllables,
although further investigation would be necessary to assert this claim with
confidence. Thus, while the data available to me certainly do not disprove the
hypothesis that Selkup stress is truly default-to-opposite, there appears to be enough
counterevidence to cast some uncertainty on this claim.

2.2. Default stress as intonational prominence
There were four languages in the survey for which there is evidence that the default
stress pattern in words consisting of only light syllables is intonational prominence
rather than stress. These include Chuvash, Northwest Mari, Eastern Mari, and
Huasteco. Chuvash is perhaps the most compelling case of default stress re-
analyzed as intonational prominence, owing to a recent phonetic study by
Dobrovolsky (1999). Chuvash is thus discussed first in section 2.2.1. Northwest
Mari, Eastern Mari, and Huasteco are then considered in sections 2.2.2, 2.2.3, and
2.2.4, respectively.

2.2.1. Chuvash
Work by Krueger (1961) presents a default-to-opposite analysis of Chuvash stress
(see Dobrovolsky for further references on Chuvash stress). Recall from section 1
that Krueger’s analysis posits stress on the rightmost heavy syllable, where heavy is
equivalent to a syllable containing a non-central vowel, otherwise on the initial
syllable in words with only light syllables.

Recent work by Dobrovolsky (1999) investigating the phonetic correlates of
stress in Chuvash, however, suggests a different interpretation of Chuvash stress.
For all syllables found in a corpus consisting of disyllabic words uttered in
isolation, Dobrovolsky measured the peak intensity, the average intensity, the
duration, the fundamental frequency, and the intensity integral, which is intensity
integrated over time (see Beckman 1986 for discussion of this measure). His word
list included the four logically possible combinations of heavy and light syllables for
a disyllabic word: Ԑ Ԑ, Ԑ Ԑ, Ԑ Ԑ, Ԑ Ԑ which are predicted to have the following stress
patterns, respectively, according to Krueger’s default-to-opposite account: Ԑ Ԑ,
Ԑ Ԑ, Ԑ Ԑ, Ԑ Ԑ.

Dobrovolsky found that, while at least certain intensity measures differentiated
stressed from unstressed syllables in most word shapes, he found that light syllables
were not typically characterized by greater peak, average, and total intensity, nor by
increased duration, even when occurring in positions predicted to carry stress (i.e.
the first syllable in Ԑ Ԑ). Rather, Dobrovolsky found that the first syllable usually
contained the fundamental frequency peak in the word followed by a fall in
fundamental frequency throughout the rest of the word. This fundamental frequency
peak and then fall was a consistent property of the initial syllable, even for initial
syllables predicted to be unstressed. As Dobrovolsky suggests, the picture which
thus emerges is one in which certain prominence correlates do not pattern together. At least one of the intensity and/or durational correlates of stress are associated with stressed heavy syllables, whereas a fundamental frequency peak is consistently associated with the initial syllable independent of syllable weight. Dobrovolsky interprets this mismatch as a divergence between intonational and stress prominence. Heavy syllables have the potential to be stressed, as indicated by increased duration and/or intensity, whereas the initial syllable is prominent by virtue of its intonational properties.

Adopting Dobrovolsky’s analysis leads to a re-interpretation of Chuvash stress in which words consisting of only light syllables, the “default” case, lack stress, while all words have intonational prominence on the initial syllable even if they have a stressed syllable later in the word. This combination of intonational prominence and stressless words necessitates a phonological analysis (not provided here due to space limitations) incorporating both stress-based and intonational prominence.

It is also worth pointing out that there is an important intonational issue which Dobrovolsky’s study leaves unresolved. It is unclear whether the fundamental frequency peak and subsequent fall found in Dobrovolsky’s study is a word-level property or is a feature of a larger intonational unit, such as the phrase or the utterance. If the latter scenario is true, then we would not expect generally to find a fundamental frequency peak in words in non-initial position of this larger intonational unit. Unfortunately, we are currently not in a position to address the nature of intonation domains in Chuvash.

However, given the fact that intonational properties cross-linguistically tend to be associated with prosodic units larger than the word, it is quite plausible that the fundamental frequency peak in Dobrovolsky’s data is not a feature of all words. In fact, the phenomenon under consideration, namely the early fundamental frequency peak, is likely to belong a domain larger than the word. Cross-linguistically, fundamental frequency tends to be highest at or near the beginning of large intonational units, such as utterances, and then gradually decline (cf. Maddieson 1997 for an overview of the declination literature). The early fundamental frequency peak and subsequent fundamental frequency decline in Chuvash conform to this pervasive pattern, under the assumption that these intonational features are a property of a domain larger than the word.

More generally, the Chuvash data raises the question of whether other default-to-opposite stress systems in which the default side is the left side are also amenable to an intonationally-based analysis of default stress. Crucially, the only languages for which this analysis is plausible are those in which the default side is the left side, since fundamental frequency values overwhelmingly tend to be highest cross-linguistically at or near the left edge of domains and then decline as one moves rightward. It thus seems unlikely that stress on the final syllable could be linked increased fundamental frequency, barring an exceptional intonational system in which fundamental frequency values are highest at the end of domains.

Before seriously extending the Chuvash analysis to other languages with default-to-left stress, there is a paradox which must be addressed. While intonation is characteristically a property of domains larger than the word, stress is typically assumed to be a feature of the word. It is thus not immediately clear how the intonationally-driven analysis extends to all words.

I would suggest that there are two lines to take in resolving this apparent paradox. First, it seems plausible that many of the stress patterns reported in the descriptive literature are based on words uttered in isolation, a context in which the word is coextensive with the utterance. If this is in fact true, then the intonationally-
based analysis of default-to-left stress may be viable for many languages. Second, there are languages with a documented asymmetry between utterance-level and word-level stress which conforms to the predictions of the intonationally-based analysis of default-to-left stress. In these languages, the default pattern of initial stress is found in words uttered in isolation, where intonational prominence is plausibly present on the initial syllable, while words embedded in a phrasal context have different stress patterns, which are less likely to be attributed to intonational prominence. The better documented of these languages is Northwest Mari which is discussed in the section 2.2.2. Eastern Mari, which presents a less clear cut example of stress asymmetries between isolation words and those embedded in a phrasal context, is briefly examined in section 2.2.3. Huasteco, another language with intonationally-driven stress, albeit of a slightly different type, is discussed in section 2.2.4.

2.2.2. Northwest Mari
According to Ivanov and Tuzharov (1970), stress in Northwest Mari falls on the rightmost non-final heavy syllable, where heavy syllables are those with a full vowel. In words lacking heavy syllables, stress falls on the first or second syllable, depending on the quality of the first vowel. If the first vowel is a rounded non-full vowel [ü] or [ỹ], stress consistently falls on the second syllable; if the first vowel is an unrounded non-full vowel [i] or [ũ], stress falls on either the first or the second syllable. This description of Northwest Mari stress, discussed in the theoretical literature by Kenstowicz (1994), clearly entails a default-to-opposite stress pattern in conjunction with stress repulsion from the absolute final and, in certain cases, the absolute initial syllables.

Interestingly, Ivanov and Tuzharov point out that this pattern is characteristic of words in isolation, but is not consistently a feature of words embedded in a larger context. For embedded words, there is some preference for penultimate stress. Thus, the default stress pattern near the left edge of isolation is only consistently a property of a phrasal domain larger than the word. This accords with the hypothesis that default-to-left stress is intonational prominence attributed to a fundamental frequency peak occurring early in the intonation domain. Assuming that the default stress is intonational prominence, what is interesting about the Northwest Mari case is the fact that the fundamental frequency peak falls generally falls on the second syllable rather than the first syllable, unlike in Chuvash. This pattern becomes less surprising when one considers that a slight rise in fundamental frequency is often observed in languages at the beginning of utterances before the subsequent declination commences. Given that the light vowels in Northwest Mari are central vowels which tend to be phonetically short in duration (see Gruzov 1960 for phonetic data from the literary Mari dialect, which makes the same weight distinction as Northwest Mari), the fundamental frequency peak presumably falls, durationally speaking, quite near the left edge.

2.2.3. Eastern Mari
Descriptions of Eastern Mari stress are less comprehensive than Ivanov and Tuzharov’s account of Northwest Mari stress. Itkonen (1955) and Sebeok and Ingemann (1961) describe a default-to-opposite pattern in which the rightmost heavy syllable (where heavy syllables contain full vowels) is stressed, otherwise the
initial syllable is stressed. Ristinen (1960), however, questions the predictability of stress in Eastern Mari and suggests that the default-to-opposite pattern is characteristic of words uttered in isolation, but not those in a phrasal context. Ristinen (1960) does not offer a systematic alternative analysis of stress, but merely comments on the difficulties involved in transcribing stress. In summary, Eastern Mari does not appear to be a convincing case of default-to-opposite stress; instead, it would appear to be a potential candidate for reanalysis of default-to-left stress in terms of intonational prominence.

2.2.4. Huasteco
Yet another language in which stress appears to be based on intonational prominence is Huasteco (Larsen and Pike 1949). According to Larsen and Pike's account, stress falls on the rightmost heavy syllable (where heavy syllables contain long vowels), otherwise on the initial syllable. They also note, however, that the location of stress is closely pinned to the particular intonational contour associated with a given utterance. Stresses dock on syllables which carry intonational peaks, such that stress moves when the intonation changes. A consequence of the close dependence of stress on intonation is that not only the default stress pattern in words containing only light syllables, but also the stress found in words containing heavy syllables is intonationally-driven. Huasteco thus differs from Chuvash, Northwest Mari, and Eastern Mari. It should be noted that the Huasteco data raises issues about the proper analysis of the relationship between the intonation system and both syllable weight and stress. Nevertheless, the apparent directionality of the relationship between stress and intonation suggests that the Huasteco stress system may not fit the profile of a true default-to-opposite stress system.

2.3. Other default-to-opposite stress patterns
Thus far, we have examined nine candidate languages for default-to-opposite stress whose stress systems are plausibly re-analyzed as involving secondary stress on non-primary stressed heavy syllables or as possessing intonational prominence rather than stress in words lacking heavy syllables. This leaves two languages in the survey of default-to-opposite stress which do not appear to be straightforward candidates for re-analysis. The first of these languages is Classical Arabic, whose stress system is the subject of considerable debate, while the second language is Kwakw'ala whose stress description remains inconclusive in certain crucial respects. Classical Arabic is discussed in section 2.3.1, while Kwakw'ala is the subject of section 2.3.2.

2.3.1. Classical Arabic
Classical Arabic is perhaps the most familiar case of default-to-opposite stress from the theoretical literature, largely owing to the work of John McCarthy (1979). McCarthy reports a default-to-stress pattern for Classical Arabic, according to which stress falls on the rightmost heavy syllable, otherwise on the initial syllable. Both CVV and CVC are heavy in non-final syllables, whereas only CVV(C) and CVCC are heavy in final syllables.

While the stress facts for words containing at least one heavy syllable are generally agreed upon, the situation for words containing only light syllables is considerably less clear-cut. According to certain accounts, e.g., Abdo (1969),

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6 Sebeok and Ingemann (1961) actually say that the default-to-opposite stress pattern is in free variation with another pattern, whereby words have final stress regardless of syllable weight.
primary stress is claimed to fall on the antepenult in words without heavy syllables, whereas, according to the account adopted by McCarthy, stress fell on the initial syllable in such words. According to Angoujad (1990), Wright (1859) proposes a hybrid account, whereby the first syllable is stressed in words containing all lights, and in words in which the only heavy syllable falls before the antepenult. In addition, there is the question of whether non-primary stressed heavy syllables receive secondary stress or not, a largely unresolved issue which commonly arises in discussion of modern Arabic varieties and is therefore likely to be relevant for Classical Arabic as well. Angoujad (1990), who provides a summary of the Classical Arabic stress controversy (pp. 282-4), leans toward Abdo’s (1969) account, stating that his description finds support from the actual pronunciation of classical Arabic by speakers of certain modern dialects. Nevertheless, he admits that prospects of finding definitive data on Classical Arabic data are not particularly promising given the lack of native speakers of classical Arabic and the lack of compelling evidence in descriptions written by classical Arabic grammarians. Given the uncertainty surrounding the stress data, it appears that we should withhold judgment on whether Classical Arabic is truly an example of a default-to-opposite stress system with neither secondary stress nor intonationally-based prominence.

2.3.2. Kwakw’ala
The final language to consider is Kwakw’ala, a Wakashan language whose stress system has been described by Boas (1947), Bach (1975), and Wilson (1986). Kwakw’ala is frequently inferred to have a default-to-opposite stress system, based on the description given by Bach which draws heavily from Boas’ earlier work. This description suggests that stress falls on the leftmost heavy syllable (heavy=CVV, CVR), otherwise on the final syllable.

Although the default-to-opposite pattern is certainly compatible with the observations of Boas (1947), Boas’ description is open to other interpretations. Boas reports that stems with initial CV, CVO have accent on second or a later syllable (Boas, pg. 218). This leaves open the possibility that words with more than two syllables may have stress on the second syllable, which would be non-final. Such a stress pattern, which actually occurs frequently in Boas’ data, contradicts the default-to-opposite pattern. The basis for the default-to-opposite description is presumably grounded in Boas’ observation that CeCeCa stems have final stress in terminal position. This stress pattern, however, holds of one particular type of stem in one particular context, terminal position, which presumably corresponds to final position of some domain larger than the word. Boas does not offer explicit discussion of stress patterns for stems other than CeCeCa and does not talk about stress in non-terminal positions. Without this information, it is difficult to speak confidently of Kwakw’ala as a language with default-to-opposite stress.

3. Conclusions
In summary, examination of the cases of default-to-opposite stress cited in the theoretical literature fails to offer conclusive evidence for the existence of true default-to-opposite stress systems. Many apparent default-to-opposite stress systems distinguish between two levels of stress, a distinction which limits the scope of default-to-opposite stress to primary stress. Other apparent default-to-opposite stress systems are amenable to re-analysis in terms of intonational prominence rather than stress in words consisting of only light syllables. The intonationally-driven analysis of default-to-opposite stress is supported by documented
asymmetries between word-level stress, where intonational prominence is unlikely to play a role in stress judgments, and utterance-level stress, where intonational properties potentially provide the percept of stress in the absence of other syllables possessing acoustic cues to stress-based prominence.

The proposed re-analysis of default-to-opposite stress potentially offers an explanation for an asymmetry in the relative frequency of the default-to-left languages versus those with default-to-right stress. Recall from section 2 that nine languages in which the default side is the left side were documented in the survey, whereas only two in which the default side is the right side were found. In the case of default-to-left stress, there are two potential pitfalls involved in the transcription of stress. First, there is the intonational prominence potentially present on the first syllable of isolation words which can easily be transcribed as stress in the absence of other prominent syllables. Second, there are potentially secondary stresses present which may be perceptually much less salient than the primary stress. In the case of default-to-right stress, only the issue of transcribing potentially subtle secondary stresses is at issue. Intonational prominence is not at issue, since there is unlikely to be an intonation peak at the right edge of an utterance. Assuming that both the transcription of intonational prominence and the transcription of secondary stress are roughly equally delicate issues, then it is not surprising that there are more cases in the theoretical literature of default-to-left stress, where both factors are potentially relevant, than default-to-right stress, where only secondary stress on heavy syllables presents a potential confound. It should of course be noted that it is highly speculative to assume that intonational prominence and secondary stress are equally problematic for the transcriber of stress. I merely offer this suggestion as a possible explanation for the numerical asymmetry found in the theoretical literature on default-to-opposite stress.

There are questions raised by the proposed re-analysis of default-to-opposite stress. The factors claimed to underlie stress systems analyzed as default-to-opposite stress also have the potential to be present in stress systems in which the stress attracting edge in words containing at least one heavy syllable is the same as in words consisting of only light syllables, so called “default-to-same” systems. It is thus conceivable that many default-to-same stress systems should be re-analyzed either in terms of intonational prominence or secondary stress on heavy syllables. For that matter, intonational prominence may also underlie stress judgments in certain languages with fixed initial stress regardless of the weight of syllables in a word. Presumably, future research will lead to re-analysis of other types of stress systems. Indeed, transcription of secondary stress on heavy syllables is a problematic issue for many languages which do not have default-to-opposite stress, e.g. many Arabic varieties (see Angoujard 1990 for discussion), Hungarian (Kerek 1971). Furthermore, separation of intonational prominence and stress is a tricky issue in many languages never claimed to have default-to-opposite stress, e.g., Korean (see Koo 1986; Lee 1990; Jun 1993), French (see Jun & Fougeron 1995).

It is also conceivable that certain weight-sensitive stress systems could possess both intonational prominence on initial syllables and weight-sensitive secondary stress. In fact, two languages examined in this paper, Kuuku Ya’u and Khalkha Mongolian, are candidates for such an analysis, although the necessary intonational evidence from these languages is currently lacking. Only thorough prosodic analysis on the level of individual languages will lead to a comprehensive cross-linguistic taxonomy of stress and intonation systems.

The proposed re-analyses of default-to-opposite stress also has implications for the theoretical treatment of stress. These implications differ according to the type of
Re-examining Default-to-opposite Stress

re-analysis adopted. For languages with secondary stress on heavy syllables not carrying primary stress, there is no longer a need for a separation of Align constraints into broad constraints requiring alignment of stressed syllables with edges and narrow constraints requiring alignment of stressed light syllables with edges (Zoll 1997). Instead of the narrow constraints referring specifically to stressed light syllables, Align constraints referring specifically to primary stress are required, as Walker (1996) and Bakovic (1998) show. Because these constraints are independently necessary regardless of one’s treatment of default-to-opposite stress, an analysis in which all heavy syllables carry some level of stress leads to a reduction in the constraint inventory. For languages with intonational prominence in words lacking heavy syllable, separate Align constraints referring to intonational properties are necessary. These constraints are also independently needed to account for intonation in a wide variety of languages. In summary, the proposed re-analyses of default-to-opposite stress thus appears to have the desirable result of ultimately simplifying metrical stress theory.

References


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What is American English /l/ Really?

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Many authors (De Camp 1945; Kahn 1980: 150-1; Wells 1982: 49; Veatch 1991: 55ff; Harris 1994: 257ff; Guenter, Lewis & Urban 1999) have made some claim to the effect that American English /l/ is not just phonetically a glide but phonologically a glide as well, based on the following reasons:

1) American English /l/ is phonetically a central approximant [l], akin to the central approximants [j] and [w], and not a true sonorant consonant like [n] or [m].
2) A reduced set of vowels contrast before /l/, as few as 4 or 5 in some dialects, as in ear, air, are, oar, poor. All the American English vowel phonemes /i e e æ u u o ɔ a ʌ aj aw ɔj/ can occur before most consonants.
3) Stressed syllabic equivalents of /j w r/ exist (the vowels [i u ʊ]) in words like sea, sue, and sir, but no other stressed sonorants exist. For example, the stressed syllable *[sn] is not possible in American English.
4) Like /j/ and /w/, /l/ is not found after tautosyllabic diphthongs. There are no sequences like tautosyllabic *[ajw] or *[owj] in English. Historical sequences of [ajr] or [awr] have resyllabified to [ajr] and [awr], so this constraint holds. However, sonorants like /n/ can be found after tautosyllabic diphthongs in words like line and gown.
5) The flap [r] is found after [j w r] so words like lighter, louder, and carder are [læɪtr], [lɔʊər], and [kɑːdr] respectively. But this flap does not occur after consonants like [n], so wander is [wændər], not *[wændər].
6) Final /l/ and /d/ are sometimes deleted after true consonants, but they are never deleted after /l/, vowels, and the glides /j w/ (Guy 1980). Thus, the word want can be pronounced [wænt], but the word cart is always [kɑːt], never *[kɑːt].

The question this raises is: How does /l/ pattern? Given that /l/ and /r/ sounds frequently pattern together cross-linguistically, we might expect /l/ to pattern with /r/ (and the other glides /j/ and /w/), or with the true sonorant consonants like /n/ or /m/. Kahn (1980: 120ff) contrasts /l/ with /r/, claiming that /r w j/ form a natural class, but that /l/ is in the class with the other consonants. However, Veatch (1991: 67-9) says that in some American English dialects /l/ may have shifted from being a coda consonant into a “glide slot” alongside /r w j/.

The purpose of this paper is to see if there are any ways in which /l/ of any dialect of American English is claimed to pattern like /r w j/ and not like the true
consonants, and to particularly determine if this is true for one particular dialect (California English, henceforth CE).

Data:

Speakers: All speakers were native speakers of California English between the ages of 19 and 29. Three were Female Northern Californians (FN), five were Female Southern Californians (FS), three were Male Northern Californians (MN), and three were Male Southern Californians (MS).

Recording: Speakers were asked to read a list of words spoken in a frame sentence of “They said [x] twice.” Each sentence was read once. The recordings were then digitized using a Kay CSL Model 4300.

This data, alongside claims made in the literature for other American English dialects will be used to see if /l/ patterns like the glides /r w j/ or like the true consonants based on the criteria given above.

First Question: Is /l/ phonetically a central approximant?
Answer: No, it’s a lateral consonant, usually the velarized alveolar lateral [ɬ]. However, Ash (1982) has found post-vocalic /l/ to be the velar central approximant [uʃ] in parts of Pennsylvania.¹

CE? Six of the fourteen speakers show post-vocalic /l/ as [uʃ]. My evidence for this is a lack of drop-off of energy after the production of the vowel. A true consonantal /l/ should have some degree of obstruction causing a loss of amplitude, while there would be no obstruction in the production of a central approximant. This difference can be seen in Speaker 04’s pronunciation of the word L (3, below. This and all subsequent figures are at the end of the paper after the references.) in which there is clear drop-off of amplitude, indicating a consonantal /l/. However, in Speaker 08’s pronunciation of the word L (4), there is no drop-off of amplitude, indicating a non-consonantal /l/.

Second Question: Does stressed syllabic /l/ occur?
Answer: No. Stressed syllabic equivalents of /j w r/ occurs as [i u ɹ] in beat, boot, burn, but no other segment in English has this variant (Kahn 1980: 150-1).

However, Kantrner & West (1938: 328) say that /l/ in the word milk could be pronounced [mɪk]. Bailey (1985: 237) claims the sequence /ol/ in words like pull can be [ɬɬ:]. Wells (1982: 551) claims stressed syllabic velar [ɬɬ:] occurs as a variant of /ol/ in some Southern American dialects. Hammond (1999: 143) claims both /ol/ and /ɬl/ can be pronounced as syllabic laterals in some dialects.

CE? I found no syllabic /l/ corresponding to /l/ or /ɬl/ sequences in the data. However, I found the sequence /ol/ in the word pull to be [ɬɬ] for five of the fourteen speakers. My evidence for this is a steady state nucleus in the word pull. If this word truly has a sequence of a vowel followed by a consonant, we should see some difference between the vowel and the consonant. However, the stressed syllabic [ɬɬ] should only have a steady state. I also compared speakers’ pronunciations of the word pull to their pronunciations of the second syllable in the word couple. The second syllable of the word should have a syllabic /l/, hence just a steady state nucleus.

¹ Thomas (2000) concurs that vocalization of post-vocalic /l/ exists, but that it usually rounded, hence [w], not [uʃ]. I am still using the symbol [uʃ], however, to avoid confusion with unambiguous [w].
What is American English /l/ really?

We can see the difference between a syllabic /l/ versus a sequence of a vowel followed by a consonant by comparing Speaker 02’s pronunciation of the words pull and couple with Speaker 09’s pronunciation of these same words. In Speaker 02’s pronunciation of the word pull (5) we can see a clear distinction between the vowel [u] and the following consonant [l]. This is different from their steady state nucleus in the second syllable of couple. However, in Speaker 09’s pronunciation of the word pull (6), we see a very steady state nucleus with no distinction between a vowel and following consonant. This is very much the same as Speaker 09’s pronunciation of the second syllable of the word couple, the only difference being the duration.

Third Question: Is there lack of contrast in vowels before /l/?

Answer: No. All standard vowel phonemes of American English /a e e u o ə æ ə j aw ɔi/ occur before /l/ in the words eel, ill, ale, L, Al, pool, pull, hole, all, doll, hull, isle, owl, oil respectively.

However, merger of contrast for many sets of vowels before /l/ in many dialects of American English have been reported. Specifically, /l/ and /l/ may merge in Utah, Western Pennsylvania/Ohio, Texas/Oklahoma, and North Carolina; /u/ and /u/ may merge in Utah, Western Pennsylvania/Ohio, Maryland, Texas/Oklahoma, North Carolina; /u/, /u/, and /o/ may merge in Western Pennsylvania/Ohio; /e/ and /e/ merge in Texas/Oklahoma and California; /a/ and /a/ may merge in Ohio and Texas; /a/ and /e/ may merge in California; and, /a/ and /o/ may merge in California².

CE? I found no mergers of /l-1/, /l-u-o/, /e-e/ or /æ-e/. No merger of /ʌ-ɔ/ could be found because the vowel [ɔ] does not occur as a distinct phoneme in CE, having merged in every position with /al/. However, I did find evidence of mergers of /u-u/ and /ʌ-ʌ/ before /l/ for some speakers. My evidence for these mergers is a perception test. In this test, all utterances of the words pull, pull, hole, and hull spoken by all 14 speakers (56 utterances total) were played to a panel of 13 judges. All the judges were either trained linguists or native Californians. Words were played in a random order. Judges were asked to identify what words they heard by circling the appropriate word on a pre-printed sheet of paper. The results are in (1), below.

From the table below, we can see that there was one situation where a large majority (> 75%) of the judges identified an utterance of the word pull as pool, and two situations where a large majority of the judges identified utterances of the word hull as hole. There were no instances in which a majority of judges identified an utterance of the word pool as pull or an utterance of the word hole as hull. I conclude from this that merger of some vowels before /l/ has taken place in CE. Since these mergers are unidirectional, we can simply say that for some speakers two sound changes have taken place:

\[ u > u/ _1 \]
\[ ʌ > ɔ/ _1 \]

² Sources for these mergers are: Utah (Labov et al. 1972; Di Paolo 1988); Western Pennsylvania/Ohio (Johnson 1971; Hankey 1972; Thomas 1989; Dickey 1997; McElhinny 1999), Texas/Oklahoma (Bailey et al. 1991; Bernstein 1993; Bailey et al 1993), North Carolina (Thomas 2000), Maryland (Bowie 1998), California (Veatch 1992).
Data is listed by Speaker on the left-hand column. Bold face indicates words that a significant majority of speakers categorized "incorrectly."

<table>
<thead>
<tr>
<th>word read:</th>
<th>pool</th>
<th>pull</th>
<th>hull</th>
<th>hole</th>
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<td>word circled:</td>
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Evidence for these mergers can also be seen looking at sound spectrograms of the speakers' recordings. In (7) we can see Speaker 04's pronunciations of the words pool and pull. They are virtually the same with regard to formant frequencies, having only a difference of duration. This can be contrasted with Speaker 14's pronunciations of pool and pull (8). The two words are clearly different with regard to formant frequencies. The word pull has a higher F2 throughout than the word pool, indicating a more centralized and/or less rounded vowel.

In (9) we can see Speaker 06's pronunciations of the words hole and hull. They are virtually the same. This can be contrasted with Speaker 03's pronunciations of the same two words (10). The words are clearly different with regard to formant frequencies. The word hull has a higher F2 throughout than the word hole, indicating a more centralized and/or less rounded vowel.

Fourth Question: Is /l/ allowed after tautosyllabic diphthongs?
Answer: Yes. Kahn (1980: 122) has [tajl], [tojl] for tile, toil, etc.
However, Bronstein (1960: 201) has [fajl], skawol, fojol] for file, scowl, foil.
Veatch (1991: 68) counts two syllables in owl and oil. Lavoie & Cohn (1999) gave 6 subjects a questionnaire in which they were supposed to count the syllables of a list of words. Half of their subjects said words like file and oil were monosyllabic. Half said they had more than one syllable (subjects were allowed the possibility of claiming a word had 1.5 syllables).

CE? Speakers read the words Nile, denial, line, and lion. We expect Nile to be monosyllabic, coming from Latin Nilus (the -us suffix would have dropped) and denial to be bisyllabic (after the /l/), coming from the Old French stem denie plus the suffix -aile. We expect the word line to be monosyllabic, coming from Old English line (the final syllable would have dropped) and the word lion to be bisyllabic, coming from Middle French lioun. Hence, if /l/ is not allowed after tautosyllabic diphthongs, and resyllabification has occurred, then the word Nile should rhyme with denial. Furthermore, both of these words should pattern syllabically like lion, not line.
What is American English /l/ really?

Speakers also read the words owl, avowal, gown, and MacGowan. We expect owl to be monosyllabic, coming from Old English ule and we expect avowal to be bisyllabic (after the /l/), coming from the Old French verb avouer plus the suffix -alie. We expect gown to be monosyllabic, coming from Old French goune, and the name MacGowan to be bisyllabic (after the /g/), based on its spelling.

We can see from (11) (Speaker 03’s pronunciation of the words line and lion) what the difference between a monosyllabic and bisyllabic word is. In the monosyllabic line, F2 of the diphthong /aɪ/ rises to a peak immediately before the following sonorant /n/. In the bisyllabic (de)nial, F2 of the diphthong /aɪ/ rises to a peak, then there is a period of decline of around 95ms before the sonorant /n/.

In (12), we can see that Speaker 03’s pronunciation of the words Nile and (de)nial are virtually clones. Furthermore, both follow the pattern of the bisyllabic lion, not the monosyllabic line, in that F2 of the diphthong /aɪ/ rises to a peak and then declines for a period, instead of ending abruptly at the peak. All fourteen speakers show the same patterns as Speaker 03 with regard to the words Nile and denial.

In (13) (Speaker 11’s pronunciations of the words gown and MacGowan), we can see what the difference between a monosyllabic and a bisyllabic word is with regard to words with the diphthong /aw/. The pattern is opposite to that of lion and line. In the monosyllabic word gown, F2 of the diphthong /aw/ declines to a low point immediately before the following /n/. In the bisyllabic (Mac)Gowan, F2 of the diphthong /aw/ declines to a low point, then there is a period of raising of F2 (around 80 ms) before the /n/.

In (14), we can see that Speaker 12’s pronunciation of the words owl and (av)owal, while not being the virtual clones we saw for Nile and (de)nial above, both show the bisyllabic pattern in that F2 of the diphthong /aw/ declines to a low point before raising for a period. Thirteen of the fourteen speakers have this pattern. A possible exception is Speaker 06. We can see a bit of a difference in Speaker 06’s pronunciations of owl and (av)owal (15). Speaker 06’s pronunciation of owl seems to follow the monosyllabic pattern of gown in that F2 of the diphthong /aw/ declines to a low point and then ends. Speaker 06’s pronunciation of (av)owal seems to follow the bisyllabic pattern more in that there is a period of around 107ms after F2 of the diphthong /aw/ reaches its low point (though no raising is obvious).

I conclude from this that resyllabification of /l/ after tautosyllabic diphthongs is very widespread in CE. This sound change has probably spread completely after the diphthong /aɪ/. It has no spread as fully after the diphthong /aw/, but there is some evidence of it. Hence, the statement that /l/ is not allowed after tautosyllabic diphthongs has some support.

Fifth Question: Are there flaps (from underlying /t/ and /d/) after /l/ before an unstressed syllable?
Answer: No. Flaps may occur after /t/ in words like forty or parting, but not after /l/ in words like shelter or filter (Kahn 1980: 93-5; Harris 1994: 217-8). I can find no claims to the contrary in the literature.

CE? All fourteen speakers were asked to pronounce the word boulder. Eleven of the speakers show a true stop [d] in this word. This can be seen in

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3 And likely after the diphthong /aɪ/, such that words oil and boil would rhyme with royal, though I have no such utterances to test.
Speaker 03’s pronunciation of *boulder* (16). There is a period of silence
accompanied by low-level voicing between the two syllables, indicating a true
stop. However, three of the speakers display a different pattern. This can be
observed in Speaker 06’s pronunciation of *boulder* (17). There is no period of
silence corresponding to a true stop between the two syllables here. Instead, all
formant frequencies continue between from the first syllable to the second, with
perhaps a very brief flap-like closure before the [σ].

I am not claiming that there is a flap in Speaker 06’s pronunciation of *boulder.*
But, there is something different from a true stop. This may be an effect of
vocalization of the previous /l/, and hence a way in which /l/ is behaving like a
glide, not like a true consonant. If we cut Speaker 03’s utterance of *boulder* in the
silent portion and play the part after the cut, it sounds impressionistically like
[dlσ]. If we cut Speaker 06’s utterance of *boulder* at an equivalent place and play
the part after the cut, it sounds impressionistically like [dlσ]4. The laterality
continues through to the production of the [σ] as we can see by the continuance of
F3. I am not entirely sure how to describe this phenomenon phonetically. Perhaps
it is a lateral flap. I am not positive that it points to a way in which American
English /l/ behaves like a glide for some speakers. It is interesting to note,
however.

Sixth Question: Do final /-t/ and /-d/ ever get deleted after /l/.

Answer: Yes, unlike after /r w j/ and vowels, after which /t/ and /d/ are
always preserved (Guy 1980). I can find no claims to the contrary in the literature.

*CE*? I have no evidence to test this claim. All my data is gathered from
artificial frame sentences, not the running text in which this deletion occurs.
Additionally, there is the problem of negative evidence. We would have to have a
large corpus in which /t/ and /d/ delete regularly after other consonants but never
after /l/ to say with any certainty that /l/ is behaving like a glide and not a true
consonant in this respect.

Conclusion: The answers for all the questions regarding the phonological status
of /l/ for all the California English speakers tested in this paper are given in (2),
below.

The checklist below can help us answer our original question: What is
American English /l/ really? It appears that some speakers such as 03, 07, 11, 12,
and 14 are more conservative. For these conservative speakers, /l/ still patterns
most like a true consonant, not a sonorant. For other speakers, such as 05, 06, 10,
and 13, /l/ patterns more like a glide, and may be well on its way to joining /l/,
/lw/, and /j/ in a natural class. I think that for now, /l/ is best analyzed as a
consonant, not a glide. However, even for the most conservative speakers, there is
still a way in which /l/ patterns like the glides /r w j/ and not a true consonant in
that it is not allowed after tautosyllabic diphthongs.

Veatch (1991: 68) claims that all of the sound changes concerning /l/ are the
result of /l/ shifting into the glide slot. The lack of complete coincidence of the
sound changes above show that the cause/effect relationship is the other way
around. Various sound changes have taken place which result in /l/ patterning like
a glide. These sound changes are in the process of spreading as I write.

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4 This was confirmed by the attending audience at the BLS 26 conference which included many
distinguished phoneticians.
What is American English /l/ really?

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References


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Reference to Abstract Entities within Clausal Complements

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0. Introduction
This paper will use techniques from the literature on referring forms to investigate reference to abstract entities within clausal complements in factive, interrogative, and bridge verb contexts. We’ll see that abstract entities introduced within factive complements exhibit identical possibilities for subsequent pronominal reference to those introduced within interrogative complements, and different from those introduced within bridge verb complements. This will motivate parallel semantic representations of factive and interrogative complementation. The investigation of reference to abstract entities will be extended to new types of abstract entities, and the nature of abstract entities denoted by nominal and non-nominal expressions will be discussed.

The issue to be investigated is whether abstract entities, upon being introduced into a discourse, are accessible to immediate subsequent reference with a personal pronoun or a demonstrative pronoun. This question can be formulated within standard theories of referential accessibility, including Accessibility Theory (Ariel 1990), Centering Theory (Grosz, Joshi and Weinstein 1983, 1995; and others) and the Givenness Hierarchy (Gundel, Hedberg and Zacharski 1993).

Centering Theory makes predictions pertaining to entities introduced or evoked within an utterance \( U_i \) in discourse \( D \) regarding their status in the next utterance, \( U_{i+1} \). The entities introduced or evoked within utterance \( U_i \) in \( D \) are the forward looking centers of \( U_i \) in \( D \), \( cf(U_i, D) \). The predictions made by Centering Theory include which among the forward looking centers of \( U_i \) is likely to be a backward looking center of \( U_{i+1} \) in \( D \), \( cb(U_{i+1}, D) \), corresponding roughly to the topic of \( U_{i+1} \). Within Centering Theory, the question pursued here is whether an abstract entity introduced in an utterance \( U_i \) is a backward looking center of utterance \( U_{i+1} \).

Accessibility Theory ranks nominal forms according to the degree of accessibility they indicate of their referents for the hearer, as assumed by the speaker. Unstressed pronouns, proximal demonstratives, and distal
demonstratives are distinct points on an extensive, many-point scale for degree of accessibility indicated.

The Givenness Hierarchy associates nominal forms, in a one-to-many fashion, with linearly ordered cognitive statuses. The minimal status possible for each form is shown in (1).

(1) in-focus > activated > familiar > uniquely > referential > type
    identifiable    identifiable

<table>
<thead>
<tr>
<th>pronouns</th>
<th>this N</th>
<th>that N</th>
<th>the N</th>
<th>this N</th>
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With respect to the Givenness Hierarchy, the question to be investigated here is whether an abstract entity, upon being introduced in an utterance $U_i$ in discourse $D$, can be assumed (by the speaker) to have the cognitive status in-focus (for the hearer), or merely the status activated, at the onset of utterance $U_{i+1}$ in $D$. We will frame referential accessibility results in terms of the Givenness Hierarchy here, but return in section 5 to implications for Centering Theory, concerning the ranking of forward looking centers.

In (2) below, a referent is given the status in-focus by utterance of the first sentence, and is then referred to by a personal pronoun in the second. In (3), a referent which is introduced more peripherally in the first sentence is made activated, but not in-focus, by the first sentence, and can be referred to more felicitously by a demonstrative than a personal pronoun in the second.\(^1\)

(2) a. My neighbors’s bull mastiff bit a girl on a bike. [GHZ 1993; (9)]
   It’s the same dog that bit Mary Ben last summer.
   b. Sam found an abandoned dog. It had a broken leg.

(3) Sears delivered new siding to my new neighbors with the bull mastiff.
   [GHZ 1993; (10)]
   # It’s the same dog that bit Mary Ben last summer.
   That’s the same dog that bit Mary Ben last summer.

1. **Review of results on the referential accessibility of abstract entities**

Abstract entities (including propositions, properties, facts and situations, introduced by non-nominal expressions) have somewhat restricted possibilities for pronominal reference. As noted in the literature (Webber 1988, Gundel, Hedberg and Zacharski 1989), propositions, facts and situations introduced by a clause can

\(^1\) In Centering Theory, the dog in (2), but not in (3), is the preferred center of the first utterance, and the backward looking center of the second utterance.
be referred to by personal pronouns and by demonstrative pronouns, but not always with equal felicity.

Borthen, Fretheim and Gundel (1997, 1999) point out that, in (4a), the personal pronoun *it* most naturally refers to the snake, not to the fact or situation of the snake being on the desk. In (4b), the demonstrative pronoun *that* can refer to the fact or situation that there is a snake on the desk, and given this reference to the fact or situation, the subsequent personal pronoun *it* can then felicitously refer to this fact or situation.

(4)  

a. There was a snake on my desk. *It* scared me. [(4a,b) from BFG 1997]  
b. There was a snake on my desk. *That* scared me, and *it* scared my office mate too.

Borthen, Fretheim and Gundel (1997, 1999) draw the generalization that an abstract entity introduced by a higher-order expression is, at that mention, activated, but not in-focus, and is therefore available to subsequent reference with a demonstrative pronoun, but not a personal pronoun; an additional mention is required for such an entity to become in-focus, and therefore available to reference with a personal pronoun.

The referent of a bridge verb complement exhibits the same behavior, as discussed by Gundel, Hedberg and Zacharski (1993). In (5), when (5a) is used to introduce the proposition that the company destroyed the file, my consultants found that this proposition can be more felicitously referred to by *that* in (5c), than by *it* in (5b). However, when (5c) is followed by (5d), the further mention of the proposition within (5c) makes it accessible to reference by *it* in (5d).

(5)  

a. Alex believes that the company destroyed the file.  
b. *It’s* false; the file has been submitted to the district judge.  
c. *That’s* false; the file has been submitted to the district judge.  
d. And if *it* were true, the company’s case would not be in better shape.  
   [it/that = that the company destroyed the file]

Furthermore, these effects are observed for properties introduced within bridge verb complements. In (6), my consultants found that the property “being fluent in Berber” introduced within the clausal complement can be more felicitously referred to by *that* in (6b) than by *it* in (6a).

(6)  

a. Alex believes that this candidate is fluent in Berber. *It’s* the most important qualification for this position.  
b. Alex believes that this candidate is fluent in Berber. *That’s* the most important qualification for this position.
There are two important caveats to these observations: First, the preference for *that* over *it* in (5) only holds when the proposition is newly introduced in (5a). When this proposition is an established discourse entity, the preference for *that* does not hold. (*We all believe that the company destroyed the file. It's not even controversial around here.*) See Borthen, Fretheim and Gundel (1999) for discussion of the role of extralinguistic context in promoting the salience of an abstract entity. Second, these effects are dependent on the nature of the linguistic expression used to introduce the entity in question; contrast the examples in (4)–(5) with those in (7).

(7)  
  a. At that moment, Maria brought up another fact (—that there is a snake in my desk). It sent shivers down my spine. [it = the fact]  
  b. Alex then introduced a new proposition (—that the company actually destroyed the file.) But it was immediately pooh-poohed.  
      [it = the proposition]  
  c. Another proposition then occurred to me (—that the company actually destroyed the file). But I immediately dismissed it. [it = the proposition]

In (7), the pronoun *it* can refer to the fact or the proposition after one mention. But these examples introduce the fact or proposition with a nominal expression. Crucially, the nominal is indefinite, so the introduced entity is new to the discourse.

2. Referential accessibility of abstract entities mentioned within factive and interrogative complements

With factive complements, given the presupposed status of the content of the complement clause, we might expect immediate subsequent reference with a pronominal form to be possible. Indeed, in (8) and (9), my consultants found *it* and *that* to be equally capable of referring to the content of the complements of the factive verbs *regret* and *verify*; in fact, they exhibited a slight preference for *it* over *that*.

(8)  
  a. Alex regrets that the company destroyed the file; *it* has impeded the investigation.  
  b. Alex regrets that the company destroyed the file; *that* has impeded the investigation.  
      [it/that = that the company destroyed the file]

---

2 With the parenthetical material in (7), the subsequent pronoun may count, not as a second mention of the abstract entity, but as a third mention. See Borthen, Fretheim and Gundel (1999) for discussion of this issue. The point here is that, even without the parenthetical material, when the pronoun is clearly only a second mention, the abstract entity is accessible to reference with this pronoun, in contrast to the pattern in (4)–(5).
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(9) A: Alex verified that the company destroyed the file.
    B: It was obvious to everyone in my office; I’m surprised it took him so long.
    B: That was obvious to everyone in my office; I’m surprised it took him so long.
       [it/that = that the company destroyed the file]

Likewise in (10), with the factive adjectival predicate *be aware*. In (11), *that* and *it* are equally felicitous in effecting immediate pronominal reference to a property when the property is mentioned within a factive complement.

(10) a. Alex is aware that the company destroyed the file. But *it* took him by surprise.
    b. Alex is aware that the company destroyed the file. But *that* took him by surprise.

(11) a. Alex verified that this candidate is fluent in Berber. *It*’s an important qualification for the position.
    b. Alex verified that this candidate is fluent in Berber. *That*’s an important qualification for the position.

The presupposed status of the content of the factive complement has the effect that this content is in-focus once the factive complement has been uttered.

Abstract entities mentioned within interrogative complements exhibit the same pattern of subsequent referential accessibility, as shown in (12)–(15).

(12) A: Alex wonders whether the company destroyed the file.
    B: It’s not likely. The file contained no incriminating information.
    B: That’s not likely. The file contained no incriminating information.
       [it/that = that the company destroyed the file]

(13) a. Alex wonders whether the candidate is fluent in Berber, for *it*’s the most important qualification for this position.
    b. Alex wonders whether the candidate is fluent in Berber, for *that*’s the most important qualification for this position.
       [it/that = being fluent in Berber]

(14) a. Alex wonders who destroyed the file; *it* has impeded the investigation.
    b. Alex wonders who destroyed the file; *that* has impeded the investigation.

(15) a. Alex wonders which candidate is fluent in Berber. *It* is a very important qualification for this position.
b. Alex wonders which candidate is fluent in Berber. That is a very important qualification for this position.

My consultants found the pronominal form *it* to be as felicitous as the demonstrative form *that* in (12)–(15); there was even a preference for *it* in (12) and (14).

3. **The referential accessibility of reasons and manners**

This section expands the inventory of abstract entities to be subject to the diagnostic of Borthen, Fretheim and Gundel (1997, 1999). The examples in (16)–(21) test for reference to reasons and manners introduced by adverbial constituents within clausal complements. In (16)–(17), with reasons and manners introduced in bridge verb complements, my consultants showed the, by now, familiar preference for *that* over *it* in subsequent reference to abstract entities introduced in these contexts.

(16) a. Alex thinks that Brenda addressed the protesters sympathetically, but firmly. *It* is the way that Susan would have handled the situation.

b. Alex thinks that Brenda addressed the protesters sympathetically, but firmly. *That* is the way that Susan would have handled the situation.

[\text{[it/that = sympathetically, but firmly]}]

(17) a. Alex believes that the company hired Susan to create web pages. *It* is the purpose they specified in the job announcement.

b. Alex believes that the company hired Susan to create web pages. *That* is the purpose they specified in the job announcement.

[\text{[it/that = to create web pages]}]

In (18)–(19), this preference is neutralized, for reasons and manners introduced by adverbial expressions in factive complements.

(18) a. Alex regrets that Brenda addressed the protesters sympathetically. *It* is not the way he would have handled the situation.

b. Alex regrets that Brenda addressed the protesters sympathetically. *That* is not the way he would have handled the situation.

(19) a. Alex recognizes that the company hired Susan to create web pages. *It* is the purpose they specified in the job announcement.

b. Alex recognizes that the company hired Susan to create web pages. *That* is the purpose they specified in the job announcement.

In (20)–(21), the preference for *that* over *it* is likewise neutralized for reasons and manners introduced by adverbial expressions within interrogative complements.
(20) a. Alex asked whether Brenda addressed the protesters sympathetically. It is not the way he would have handled the situation.

   b. Alex asked whether Brenda addressed the protesters sympathetically. That is not the way he would have handled the situation.

(21) a. Alex wonders whether the company hired Susan to create web pages. It is the reason they specified in the job announcement.

   b. Alex wonders whether the company hired Susan to create web pages. That is the reason they specified in the job announcement.

Reasons and manners thus pattern with other abstract entities in their referential behavior.

4. Discussion of results
4.1. Implications for the semantic representation of factive and interrogative complements

In sections 2 and 3, it was found that abstract entities mentioned within factive complements are accessible to immediate subsequent pronominal reference. This result must be generalized a bit. Cattell (1978) and subsequent researchers have noted that when clausal complement taking verbs and adjectives are classified according to whether they allow adjunct \textit{wh}-extraction out of their complements, there are some verbs and adjectives which are not factive (in the Kiparsky and Kiparsky 1971 sense of presupposing the truth of their complement clauses), but which pattern with the factives. These include verbs such as \textit{agree}, \textit{emphasize}, \textit{doubt}, and \textit{deny}, and the adjectival predicate \textit{be certain}. These pattern with factives according to the present criterion as well, as in (22).

(22) a. Alex and Susan agree that the company destroyed the file. I'm surprised that they believe it.

   b. Alex and Susan agree that the company destroyed the file. I'm surprised that they believe that.

Although these verbs and adjectives do not carry a presupposition of the \textbf{truth} of their complements, they do seem to require that their complements denote established discourse entities, a property which they share with the factives. This property seems to be the key to the referential behavior observed here. There isn't a convenient way to designate these non-factive verbs and adjectives that pattern with the factives. (On Cattell's classification, they are non-volunteer stance, and include some response stance predicates and some non-stance predicates.) I will call these, together with factives, the \textit{established content} (EC) verbs and adjectives.
These considerations, taken together, motivate a semantic representation of EC ascriptions on which the content of the complement clause restricts a discourse entity, a fact or associated situation or event. In Discourse Representation Theory, for example, the factive ascription in (9A) must occur in a context such as that shown in (23), in which, on the formulation adopted here, an established or accommodated event in a Davidsonian event semantics (such as that of Higginbotham 1985) is restricted by the EC complement to be one in which the company destroyed the file.

(23)  
\[
\begin{array}{|c|}
\hline
u, v, z, e \\
\hline
Alex (u) \\
Company (v) \\
File (z) \\
destroy (v, z, e) (w_o) \\
verify (u, \lambda w[ destroy (v, z, e)(w) ]) \\
\hline
\end{array}
\]


For our purposes here, the discourse status of the associated event will be expressed by the iota operator, as in (24), restricted by the content of the complement clause.

(24)  \[ \iota e [\text{destroy} (c, f, e)(w_o)] \ [\text{verify} (a, \lambda w[\text{destroy} (c, f, e)(w) ])] \]

The results obtained for interrogative complements in sections 2 and 3 above suggest that the content of an interrogative complement should, like that of factive and other EC complements, serve to restrict a discourse situation or event.

But this status has not been expressed in semantic representations of interrogative complements in the literature, such as the Karttunen (1977) representation of (12A) as in (25).\footnote{Karttunen’s (1977) representation was based on earlier work by Hamblin (1973). The notational adaptation and simplification of Karttunen’s proposal given in (25) is adopted here following Rullmann (1995).}

(25)  \[ \text{wonder} (a, \lambda p[p(w_o) \& (p = \lambda w[\text{destroy} (c, f, w)] \lor \\
\quad p = \lambda w[\sim \text{destroy} (c, f, w)])]) \]

On the representation in (25), Alex is in the relation \textit{wonder} to those propositions holding of the actual world on which the company destroyed or didn’t destroy the file in question. Which proposition it is that Alex is in the \textit{wonder} relation to depends on which holds of the actual world. Since Alex doesn’t know which such proposition holds of the actual world, it follows that Alex doesn’t know which
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proposition he is in the wonder relation to. The Karttunen approach thus makes the proposition to which Alex is related by wonder opaque to Alex himself.

The results in (12)–(13) of section 2, regarding accessibility to pronominal reference, support a treatment of interrogative complements parallel to that given above for factive and other EC complements. We can represent (12A) as in (26), and the wonder-ascription in (14a) as in (27).

$$\exists \lambda P \ [P(x) = \lambda y [\text{destroy} (x, y)]] \ [\text{wonder} (a, \lambda y [y = P(w)])]$$

The representation in (26) is explicitly about the proposition that the company destroyed the file, construed as the set of possible worlds in which that happened, and it asserts that Alex is in the wonder relation to the proposition that the actual world is one of the worlds in that set. On this interpretation, the proposition that the company destroyed the file must be an established discourse entity prior to the utterance of (12A), or it must be accommodated in the sense of Heim (1982). Likewise, the representation in (27) pertains to the property that holds (across worlds) of those who destroyed the file, and asserts of it that Alex is in the relation of wonder to this property instantiated on the actual world. The property must be either discourse established prior to the utterance of (14a), or accommodated on the occasion of utterance. The possibility of accommodation must be observed here for examples like (28), adapted from Lahiri (1991),

$$\exists \lambda P \ [P(w) = \lambda y [\text{destroy} (x, y)]] \ [\text{wonder} (a, P(w))]$$

(28) Alex wonders where he can get gas around here.

which can be used in a context in which the content of the complement clause does not have an associated situation or event that was a prior discourse entity.

The representation of factive and interrogative complements developed in this section provides a foundation for an account, along the lines of that given by Szabolcsi and Zwarts (1992/93), of the weak islandhood of these complements to wh-extraction. Hegarty (1999) develops this connection.

4.2. On the referential accessibility of abstract entities

In this section, we’ll consider further the nature of the abstract entities subject to the generalizations arrived at in previous sections. What are abstract entities, for the purpose of the present results? What properties characterize or distinguish abstract entities in a way that might determine their special behavior with regard to referential accessibility?

For events and situations, there are fairly extensive results in the literature, on which we might draw. Lasersohn (1990), discussing the semantics of plurals, proposes that events have the algebraic structure of a join semilattice. Likewise, Schein (1993), also discussing plurals, proposes a mereology of events with “part-
of" structure, a partial ordering. Ginzburg (1995a, b) proposes that situations are structured as a Heyting algebra of states of affairs. Propositions, partially ordered under the relation of entailment, constitute a similar partial algebraic structure. Peterson (1997) cautions against reducing any of these abstract entities to the others, and urges that each be treated in its own right. Finally, Hegarty (1999) argues that reason expressions denote elements of a domain with the algebraic structure of a join semilattice; likewise for manner expressions. Thus, there is a fairly extensive literature in which abstract elements are analyzed as elements in algebraic systems with partial structure.

Recall now the results in (7) in section 1 above, which showed that abstract entities introduced by nominals share the referential accessibility of concrete entities. Abstract entities which are not discourse established are inaccessible to immediate pronominal reference only when they are introduced by non-nominal expressions. This might reflect facts about the processing of non-nominal expressions, to be captured in conditions on the cognitive status of their referents, or conditions on the ranking of forward looking centers, indexed explicitly to the linguistic form of non-nominal expressions.

Alternatively, we could approach the problem on the view argued by Fraurud (1996), that referential accessibility depends in part on the cognitive ontology of the referent. Fraurud identifies three different types of entity within a cognitive ontology: individuals, functionals, and instances of a kind or of a continuous substance. Fraurud argues that the cognitive type of an entity confers upon it a degree of individuation, different from that of entities of other cognitive types, which influences the entity’s referential accessibility.

The relative referential inaccessibility of abstract entities, when they are referred to with non-nominal expressions, could reflect their ontological status, conferred by the mathematical structure of their denotation domains. Reference is dependent on an apparatus of individuation. If nominal expressions structure their referents as members of unordered sets, then abstract entities introduced by nominal expressions should be individuated on a par with concrete entities. Abstract entities introduced by non-nominal expressions would, in contrast, be individuated as elements of more structured algebraic systems, and thus, by conjecture, individuated to a lesser degree than independent individuals. This might equally well have significance for the cognitive status of the referent, or the ranking of the entity as a forward looking center of the utterance, but a significance that originates in the nature of the referent itself, and the algebraic system of which it is a part, rather than in the linguistic form used to introduce it.

5. Conclusions
This paper has argued the following:

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- that abstract entities introduced by non-nominal expressions are merely activated when introduced within bridge verb complements, but are rendered in-focus when introduced within factive (and other EC) complements, and within interrogative complements;

- that properties, reasons and manners pattern with propositions, facts, and situations in their referential accessibility behavior; and

- that referential accessibility facts in different complement types lead to explicit representations of the interpretations of factive (and other EC) ascriptions and of ascriptions with embedded interrogatives.

Furthermore, the results given here, and those of Borthen, Fretheim and Gundel, (1997, 1999) can aid the project of ranking the forward looking centers \{Cf\} of English according to how likely they are to be the backward looking center of the next utterance. The results given here, specifically, show that for abstract entities mentioned by non-nominal expressions within clausal complements, the semantic type of the complement clause is relevant. Furthermore, the structure of the expression’s denotation domain seems to be relevant. These points support the proposal of Cote (1998) that Cf’s must be ranked in part on semantic grounds, and not just on the basis of superficial syntax.

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On the accented/unaccented distinction in Western Basque and the typology of accentual systems

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1. Introduction

Beckman (1986) draws a distinction between stress-accent and non-stress-accent (i.e., pitch-accent) languages. Stress-accent languages, such as English, convey accentual prominence by a combination of phonetic cues, including pitch, intensity and duration. Non-stress-accent languages, on the other hand, use only pitch as a correlate of accent. Tokyo Japanese is an example of the latter group.

Since in Japanese duration plays a very important role in establishing phonological contrasts (both between short and long vowels and between single and geminate consonants), a question that naturally arises is whether the phonological role of duration is responsible for the fact that this feature is not used as a correlate of accent in this language. It appears to us that the validity of Beckman’s typology can be tested with a language like Northern Bizkaian (NB) Basque which shares some important features with Tokyo Japanese but which crucially lacks durational contrasts in its phonology. A first feature that NB Basque dialects have in common with Tokyo Japanese is a lexical distinction between accented and unaccented words with most words belonging to the unaccented class (Hualde 1991, 1999). In addition, in both languages lexically accented words always surface with a $H^*+L$ pitch-accent on a given syllable (in NB Basque, lexically unaccented words do not bear any pitch-accent, unless they are in final place in the preverbal focus position, on in isolation, in which case they are also associated with a $H^*+L$ contour). A third common feature is that accental phrases are marked out by an initial rising boundary %LH-, with the high target loosely associated with the second syllable. NB Basque, on the other hand, crucially differs from Japanese, as mentioned, in not making any phonological contrasts of length. In other words, there are no long vowels or geminate consonants. Since duration is not employed in a lexically contrastive manner, Basque allows us to test whether this feature could be used as a correlate of accent in prosodic systems of the Tokyo Japanese type. Two hypotheses are entertained:

Hypothesis A: Stress-accent and pitch-accent are fundamentally different phenomena. Pitch-accent languages employ only contrasts in pitch, regardless of

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whether or not duration is used to convey phonological contrasts in the language. This is, we believe, Beckman's (1986) position.

Hypothesis B: If duration is not phonologically contrastive, languages will make use of durational differences to enhance the perception of accentual prominence, regardless of other prosodic properties.

In this paper we first establish that NB Basque has a lexical distinction between accented and unaccented words, similar to that of Japanese, as has been previously claimed (Hualde 1991, 1993, 1999, Hualde, Elordieta & Elordieta 1994, Elordieta 1997, Jun & Elordieta 1997). Second, we examine the role of duration as a correlate of accent in NB Basque. Under Hypothesis A, we would expect duration to play no role to cue accent in NB Basque, since its prosodic system agrees in fundamental respects with that of standard Japanese. Under Hypothesis B, on the other hand, we would expect to find consistent durational differences between accented and unaccented syllables in this language, since duration plays no role in establishing phonological contrasts in the language.

2. Data gathering procedure

Two female speakers in their twenties from the Northern Bizkaian area, MB and IS, were the subjects of the study. These two speakers are from different towns within this area and speak somewhat different dialects: MB is a speaker of the dialect of Bermeo and IS speaks the dialect of Markina. In spite of some differences in accentuation, the dialects of these two towns fit the characterization of the NB prosodic system which we have given above (for differences in accentual patterns between these two dialects, see Hualde 2000). As virtually all Basque speakers from this area, our subjects are bilingual in Spanish. At the time of the recording, both subjects were conducting graduate studies in the U.S.

From each of the two subjects five repetitions of 30 randomized sentences, with pauses between repetitions, were recorded and digitized directly onto a SunSparc10 station running Entropic ESPS/WAVES+. The sampling rate was 8kHz. Sentences were given to the subjects on index cards (one sentences per card) written in their respective local dialects which, as mentioned, are slightly different, and with a Spanish translation. The accuracy of the sentences was checked with the subjects before recording. One reason why the Basque sentences were accompanied by Spanish translations is that many pairs of sentences are real minimal pairs: segmentally identical but accentually different. The total number of recorded sentences was 300 (30 sentences x 5 repetitions x 2 speakers). The five repetitions of the last two sentences were discarded for speaker IS because of confusion in some repetitions, yielding 140 utterances measured for speaker IS (Markina) and 150 for speaker MB (Bermeo).

Segmentation of the target syllables for durational purposes was done manually using ESPS/Waves+, based on waveform, spectrogram, and listening. F0 measurements were taken from the pitch contour at the mid point of the initial
syllable and at all local F0 maxima in the pre-verbal phrase. The total duration of certain syllables, as explained in section 4, was also measured.

3. **Test for establishing the accented/unaccented distinction:**
In order to establish the validity of the accented/unaccented distinction we look at the value of pitch-accentual peaks after both lexically accented and lexically unaccented words in otherwise identical contexts. In Japanese an accented word that follows another accented word will be downstepped, i.e. it will have a lower F0 value than if it followed an unaccented word (Poser 1984, Beckman & Pierrehumbert 1986). Jun & Elordieta (1997) suggest that in Basque as well a lexically accented word triggers downstep of a following accent, but a lexically unaccented word does not. The prediction is then that accentual peaks will be downstepped after another H*+L accent and, therefore, will show lower values than in a context where no other pitch-accent precedes. We look at downstep effects both within constituents and across syntactic constituents.

3.1. **Downstep of lexical accents within syntactic constituents**
We constructed pairs of minimally different sentences where a given accented word was preceded by either an accented or an unaccented word with the same or nearly the same segmental make-up, with both words in the same constituent and in preverbal position:

(1) Conditions:  
A. [Word1 Unaccented Word2 ] Accented  
B. Accented Accented

In order to establish the existence of the downstepping effect, we measured the value of the accentual peak in Word 2 under both conditions. Examples of two sentences forming a contrasting pair are given below (see the appendix for the complete list of recorded sentences for one of the two dialects). Target syllables are underlined. The spectrograms and pitch tracks for one repetition of these two sentences by subject IS are also provided in Figure 1.

(2) Example of contrasting pair (Markina)
a. [lagunan ámuma] ikusi dot ‘I saw [the friend’s (sg) grandmother].’
b. [lagünen ámuma] ikusi dot ‘I saw [the friends’ (pl) grandmother].’
Figure 1. Sound wave, pitch track and label for a contrasting pair of sentences under conditions A and B.

In agreement with the analysis in Jun & Elordieta (1997) (cf. also Elordieta et al. 1999), the two pitch contours shown in Figure 1 can be characterized by the following tonal specifications in the model proposed in Pierrehumbert (1980), Pierrehumbert & Beckman (1988) and other work:

(3) Phonological analysis of tonal contours
a. \[\text{[la gu nan á mu ma]}\]  
\[%L \quad H - \quad H^*L\]
b. \[\text{[la gu nen á mu ma]}\]  
\[%L \quad H^*L \quad H^*L\]

From the obtained pitch contours, we observe two things:
1) the F0 peak of the first accent in the (b) sentences, which is the first word in the phrase, has very similar values to the peak of the only accent in the (a) sentences, which is in the second word. That is, the value of the first accentual peak appears
to be relatively constant regardless of its distance from the beginning of the utterance under normal, broad-focus, conditions (the average values for the first accentual peak over 5 tokens of the sentences in (2b) is 267Hz and, for the accentual peak in the five repetitions of (2a) by this speaker, 265Hz).

2) The F0 peak on the target word (e.g. ánuna) is much lower when it follows another accented word in the sentence than when it follows an unaccented word (for (2b) the average value is 221Hz vs. 267Hz in (2a)).

3.2. Downstep across syntactic constituents
In order to test whether syntactic boundaries block downstep, we constructed pairs of minimally different sentences in which target words appear in different syntactic constituents. Example sentences from the Bermeo dialect are given below. The pitch tracks for one of the repetitions of these two sentences by MB are provided in Figure 2 (notice, incidentally, that the word for grandmother has a lexical accent on the first syllable for IS but on the second syllable for MB):

(4) Downstep across syntactic boundaries (Bermeo version)
a. [lagunerí][amúma] etorri dxatzo. ‘[to the friend] [grandmother] arrived.’
b. [lagúnerí][amúma] etorri dxatzoye. ‘[to the friends] [grandmother] arrived.’
Figure 2. Sound wave, pitch track and label for two sentences in which target words are in separate syntactic constituents for conditions A and B (speaker MB, Bermeo).

As can be observed from the pitch contours in fig. 2, the same downstepping effects are found across syntactic constituents as within constituents. In these specific examples, the peak value for the target word when it follows an unaccented word is 260Hz. After another accented word it is 228Hz (these are average values over 5 tokens of (4a) and (4b) for speaker MB).

3.3. Downstep of ‘derived’ accents
In Basque, lexically unaccented words do not bear any pitch-accent unless they are in phrase-final preverbal position (which is the focus position), in which case they are also associated with a H*+L contour. This accent falls on the final syllable of the word in Bermeo and on the penultimate in Markina (see Hualde 2000). Following Jun & Elordieta (1997), we will refer to the accent carried by a lexically unaccented word in the focus position as ‘derived accent’ (indicated here with a grave accent mark). In order to test whether this ‘derived accent’ is affected by a preceding accent or not, we constructed pairs of minimally different sentences where a derived accent is preceded by either an accented or an unaccented word, as the following example illustrates:

(5) Downstepping of derived accents (Bermeo examples)

a. [lagunen amari] gertatu dxatzo. ‘it happened [to the friend’s (sg) mother]’
b. [lagunen amari] gertatu dxatzo. ‘it happened [to the friends’(pl) mother]’

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Figure 3. Sound wave, pitch track and label for the words with 'derived' accents in conditions A and B (subject MB, Bermeo).

As we may observe in the pitch contours in fig. 3, ‘derived accents’ are also downstepped by preceding lexical accents (263Hz vs. 201Hz in these examples, averaging over 5 repetitions). In fact in these examples the peak value for the ‘derived accent’ when preceded by an unaccented word, sentence (5b), is close in height to the peak value of the first accent in (5b).

3.4. Downstep results
In all three contexts tested, accents in condition B are lower than in condition A. This is true for every contrasting pair and for both subjects. Pooling all the data from these three contexts together we obtain the following results:
(6) Downstep: Mean values and standard deviations

**Subject 1: IS, Markina**
- Condition A (Unac–Acc) Accent Peak: 262 Hz, 13.06 Hz, 64
- Condition B (Acc–Acc) 1st Accent Peak: 268.83 Hz, 12.49 Hz, 65
  2nd Accent Peak: 213.92 Hz, 11.54 Hz, 65

**Subject 2: MB, Bermeo**
- Condition A (Unacc–Acc) Accent Peak: 197.83 Hz, 7.28 Hz, 65
- Condition B (Acc–Acc) 1st Accent Peak: 204.85 Hz, 7.34 Hz, 65
  2nd Accent Peak: 172.08 Hz, 9.55 Hz, 65

Two-factor repeated measures analyses of variance were performed on the peak height realizations of the target word with the context (A and B) and word as fixed factors and repetition as a random factor. The results for both speakers are given in Table 1. Significant results are marked by an asterisk.

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<td>Context A vs. context B</td>
<td>1, 104</td>
<td>612.930</td>
<td>.000*</td>
</tr>
<tr>
<td>Word</td>
<td>12, 1248</td>
<td>6.495</td>
<td>.000*</td>
</tr>
<tr>
<td>Context * Word</td>
<td>12, 1248</td>
<td>6.730</td>
<td>.000*</td>
</tr>
</tbody>
</table>

Table 1. ANOVA tests for pitch peak for Subject 1 (upper panel) and Subject 2 (bottom panel).

As seen in Table 1, the test results for both subjects show a significant difference between pitch peak height on the target word depending on whether it follows an accented word or an unaccented word. (There is also a significant effect of the word on pitch. In addition, for subject 2 only, the interaction between the two factors is significant.)

For both speakers, then, the target syllable has a significantly higher F0 in context B than in context A. This is explained under the hypothesis that in context B the target word is preceded by an accented word which triggers downstep of a following accent, whereas in context A the preceding context does not include any pitch-accents and hence there is no environment for the downstep effect. This proves the existence of a distinction between lexically accented and unaccented words.
4. **Duration**

We compared the duration of the syllable bearing the first accent in context B, with the duration of the segmentally identical unaccented syllable in exactly the same position in context A, as illustrated in the examples in (7), where the measured syllables are bolded:

(7) Duration (Markina examples)

1a. [lagunan ámbuma] ikusi dot. ‘I saw [the friend’s (sg) grandmother].’
1b. [lagúnən ámbuma] ikusi dot. ‘I saw [the friends’ (pl) grandmother].’

Measurement of the duration of the target syllables shows small and inconsistent differences between accented and unaccented syllables. Both subjects have tokens within minimal pairs that were longer under accent in some productions but shorter in others. The averaged durational values show that subject IS tended to produce slightly longer syllables in accented words while subject MB tended to do the opposite (some tokens had to be discarded because it was impossible to segment the target syllable precisely):

(8) Duration: Mean values and standard deviations

<table>
<thead>
<tr>
<th>Subject 1: IS, Markina</th>
<th></th>
<th>Subject 2: MB, Bermeo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>unaccented</td>
<td>accented</td>
</tr>
<tr>
<td>Mean</td>
<td>79.19 ms.</td>
<td>84.78 ms.</td>
</tr>
<tr>
<td>St. dev.</td>
<td>16.47 ms.</td>
<td>15.81 ms.</td>
</tr>
<tr>
<td>Number</td>
<td>69</td>
<td>69</td>
</tr>
</tbody>
</table>

Analyses of variance were performed on the syllable duration realizations of the target words with the presence/absence of pitch accent on the word and word as fixed factors and repetition as a random factor. The results for both speakers are given in Table 2. Significant results are marked by an asterisk.

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>df</th>
<th>F</th>
<th>Sig. (alpha= .05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence or presence of PA</td>
<td>1, 110</td>
<td>17.014</td>
<td>.000*</td>
</tr>
<tr>
<td>Word</td>
<td>13, 1430</td>
<td>32.291</td>
<td>.000*</td>
</tr>
<tr>
<td>Context * Word</td>
<td>13, 1430</td>
<td>.880</td>
<td>.576</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>FACTORS</th>
<th>df</th>
<th>F</th>
<th>Sig. (alpha=.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence or presence of PA Word</td>
<td>1, 116</td>
<td>.037</td>
<td>.848</td>
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<td>Word</td>
<td>14, 1624</td>
<td>34.543</td>
<td>.000*</td>
</tr>
<tr>
<td>Context * Word</td>
<td>14, 1624</td>
<td>1.705</td>
<td>.064</td>
</tr>
</tbody>
</table>

Table 2. ANOVA tests for duration for Subject 1 (upper panel) and Subject 2 (bottom panel).

For Subject 1 (who has slightly longer accented syllables), the presence or absence of pitch accent on the target word significantly affects the duration of the syllable. No such effect is observed for Subject 2 (who produced on average longer unaccented than accented syllables). There is also a significant effect of word on the duration for both speakers. The interaction of the two factors is not significant for either subject.

In spite of the fact that the statistical analysis employed indicates that accent affects syllable duration for one of the two subjects, IS, the durational differences found are so small that we believe they could not be perceptually detectable. In addition, subject MB shows a very small non-significant difference (about 2.5 ms. in mean values) in the opposite direction. On the basis of these data, we conclude that duration does not appear to play a role to convey accentedness in the Northern Bizkaian Basque prosodic system. Hypothesis A is thus preliminarily supported.

5. Discussion
The results from this paper support the view that there is a fundamental distinction between stress-accent and non-stress-accent (pitch-accent) languages. In stress-accent languages accentual prominence is signaled by a combination of phonetic cues, including pitch-excursions and duration. In pitch-accent languages, pitch is the only correlate of accentual prominence. Duration is not employed for this purpose even if, as it is the case in Northern Bizkaian Basque, it is not used contrastively in the phonology and could potentially be recruited as an accentual cue without jeopardizing segmental distinctions. We believe that our results offer strong support for Beckman's (1986) typology.

Appendix
Test sentences:
Syllables that were measured for duration are in bold. Syllables that were measured for F0 peak are underlined. In syllables that are both bolded and underlined, both measurements were taken. Lexically accented syllables carry an acute accent mark and a grave accent is used in words with 'derived' accent. Brackets around constituents are used in examples and translations for ease of identification. Also for the reader's convenience the English translations follow the Basque word order as closely as possible. Sentences from only one dialect are
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provided for the sake of space (There are only slight differences between the dialects. In particular, Markina Basque makes a distinction between sg /a/ and pl /e/ in some case endings that is not made in Bermeo, where all sg/pl pairs in the examples are segmentally identical).

Markina

1a. [lagunan amuma] ikusi (d)ot ‘I saw [the friend’s (sg) grandmother]’
1b. [lagunen amuma] ikusi (d)ot ‘I saw [the friends’ (pl) grandmother]’
2a. [fidelen amatâla] ekarri dau ‘s/he brought [Fidel’s apron]’
2b. [Fidelan amatâla] ekarri dau ‘s/he brought [Fidela’s apron]’
3a. [onen gisonan eriñotza] gustete(n) jate ‘I like [this man’s bay leaf]’
3b. [énen gisonen eriñotza] gustete(n) jate ‘I like [these men’s bay leaf]’
4a. [lagunai] [amuma] etorri (j)ako ‘[to the friend] [grandmother] arrived’
4b. [lagunei] [amuma] etorri (j)akue ‘[to the friends] [grandmother] arrived’
5a. [oni mutilai] [amu] galdu (j)ako ‘[to this boy] [the fishing-hook] got lost’
5b. [ónei mutillei] [amu] galdu (j)ako ‘[to these boys] [the fishing-hook] got lost’
6a. [ari gisonai] [mâlłu] jausi (j)ako ‘[to that man] [the hammer] fell’
6b. [áreigisonai] [målłu] jausi (j)ako ‘[to those men] [the hammer] fell’
7a. [lagunan amâi] pasau (j)ako ‘it happened [to the friend’s (sg) mother]’
7b. [lagünen amâi] pasau (j)ako ‘it happened [to the friends’ (pl) mother]’
8a. [Fidelen âma] loditxu da ‘[Fidel’s mother] got fat’
8b. [Fidelan âma] loditxu da ‘[Fidela’s mother] got fat’
9a. [onen gisonan bierra] gustete(n) (j)ate ‘I like [this man’s work]’
9b. [ónen gisonen bierra] gustete(n) (j)ate ‘I like [these men’s work]’
10a. [gure lagünen amuma] etorri da ‘[our friends’ (pl) grandmother] has arrived’
10b. [süen lagünen amuma] etorri da ‘[your (pl) friend’s (pl) grandmother] has arrived’
10c. [gure lagunan amuma] etorri da ‘[our friend’s (sg) grandmother] has arrived’
10d. [süen lagunan amuma] etorri da ‘[your (pl) friend’s (sg) grandmother] has arrived’
11a. [onen amûman amatála] galdu da ‘[this grandmother’s apron] got lost’
11b. [ónen amûmen amatála] galdu dau ‘[these grandmothers’ apron] got lost’
11c. [onen lagunan amatâla] galdu du ‘we lost [this friend’s apron]’
11d. [ónen lagünen amatâla] galdu du ‘we lost [these friends’ apron]’
12a. [euren lagunan amuma] etorri da ‘[their friend’s (sg) grandmother] arrived’
12b. [euren lagünen amuma] etorri da ‘[their friends’(pl) grandmother] arrived’

References

The accented/unaccented distinction in Basque


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Historical Development of Reported Speech in Chinese

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0. Introduction
This paper attempts to show the diachronic process of reported speech in Chinese based on Givon’s (1980) hypothesis of binding hierarchy relating verb meaning and complement type. He shows that complementizers occur with saying or informative verbs (i.e. say, tell) first, then with cognitive verbs (i.e. think, know or believe), then with verbs like decide or agree. The methodology I use is calculating the frequency of saying verbs, informative verbs and cognitive verbs which occur with the complementizers in Chinese vernacular short or long fiction from the Tang (A.D. 670-905) to the Qing dynasties (A.D. 1644-1908).

There are several sources for data in classical Chinese. For the Tang dynasty, the primary source is Dunhuang Bian Wen [Transformation Texts of the Dunhuang Stone Caves] (A.D. 4th - 10th century) (henceforth DBW). For the Song Dynasty (A.D. 960 – 1278), I will use Song Si Gong Da Nao Jin Hun Zhang ‘Mister Song Disturbing Jin Hun Zhang’ (henceforth SDNJ). For the data regarding usage during the Ming dynasty (A.D. 1368 - 1628), I will use a famous short work of fiction entitled Bai Niangzi Yong Zhen Leifeng Ta [Madame Bai Forever Locked in the Leifong Tower] (henceforth BYZLT). In the Qing dynasty (A.D. 1644 - 1908), a well-known work of longer fiction Hong Lou Meng ‘Dream of the Red Chamber’ by Xue-Qin Cao (A.D. 1715 -1763) (henceforth HLM), is adopted as the source for our data. Since HLM is a longer work of fiction, I will only use chapters two to five.

1. Verbs of Saying in Classical Chinese
In Chinese classical texts, especially the short or long vernacular fiction from the Tang (A.D. 670-950) to the Qing dynasties (A.D. 16447-1908), the forms such as yan ‘say’, yue ‘say’, dao ‘say’ and shuo ‘say’ are all used as utterance verbs meaning ‘say’. Among them, yan, yue and dao ‘say’ are found to introduce sentential complements when they follow another saying or informative verb.

1.1. Stage One: Tang Dynasty (A.D. 670-905)
1.1.1. As Utterance Verbs Meaning ‘say’
Two stories from *Bian Wen* are chosen as primary sources for our data. In these two stories, *yan 'say' and yue 'say' as in (1) and (2) are both commonly used as utterance verbs meaning 'say'.

(1) Zi Xu **yue** meng xiansheng yi ji.
   Zi Xu say receive mister one help
   'Zi Xu says, "I have received help from you."'

(2) Mu Lian liang jiu er **yan** shi yi Qing Ti furen fou
   Mu Lian very long then say know one Qing Ti Madame not
   'After a while, Mu Lian says, "Do you know Madame Qing Ti?"'

1.1.2. As Complementizers after Saying and Informative Verbs
In addition, in numerous examples from (3) to (5), when *yan* or *yue* introduces a sentential complement, this item occurs following another verb of saying as in (3), or verb of information as in (4) and (5). In these examples, *yan* or *yue* has lost its literal meaning and served as a complementizer to introduce a sentential complement. For example, in (3), when *yue* functions as a complementizer and introduces a sentential complement, it occurs following another verb of saying *yan*. Since two adjacent verbs of saying are redundant and unnecessary, it turns out that the two of them have different functions: the first verb *yan* has a lexical function and serves as a main verb in the main clause whereas the second verb *yue* has a grammatical function and serves as a complementizer to introduce a sentential complement.

Another observation is that in examples (4) and (5), the sentential complement introduced by the complementizer expresses what has been answered as in (4), or what has been reported as in (5) instead of what has been verbally said.

(3) kou chang ge er **yan** **yue** lu zhong yi ren...
   mouth sing song and say YUE cottage inside one person
   '(Someone) sings a song and says, "There is someone inside the cottage."'

(4) zhu ren day **yan** jin jie bu shi.
   you-gentleman answer YAN total all not know
   'Everyone answers "We do not know any of them."

(5) er shi shizun bao Mu Lian **yue** ru mu yi luo Abi.
   then time master report Mu Lian YUE you mother already fall Abi
   'Then the master reported to Mu Lian "Your mother has fallen Abi ..."'
1.1.3. Optional Complementizers

A number of examples as in (6) and (7) have been found in which an informative verb precedes a sentential complement without being followed by another yan or yue. This indicates that yan or yue as complementizers following an informative verb are optional. Since they are optional, it is more reasonable to analyze them as complementizers instead of full utterance verbs.

(6) yuzhu geng wen di qi ge zhong you Qing Ti furen fou. 
warden even ask number seven space inside have Qing Ti Madame not 
'The warden even asks "Is there a Madame Qing Ti in the seventh space?"'

(7) er zhi jian bixia shi wan ren zhi wang. 
and direct warn your-majesty be ten-thousand people POSS king 
'... and directly warns "Your majesty, you are the king of all the people..."'

Table (1) Frequency of Different Types of Verbs Preceding Yan and Yue in DBW

<table>
<thead>
<tr>
<th>Verbs Types</th>
<th>yan/yue 'tell,talk'</th>
<th>wen 'ask'</th>
<th>da 'answer'</th>
<th>bao 'report'</th>
<th>other verbs</th>
<th>cognitive verbs</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freq.</td>
<td>7</td>
<td>17</td>
<td>15</td>
<td>19</td>
<td>15</td>
<td>0</td>
<td>73</td>
</tr>
<tr>
<td>%</td>
<td>9.6</td>
<td>23.3</td>
<td>20.5</td>
<td>26.1</td>
<td>20.5</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

1.2. Stage Two: from the Song to Qing Dynasties (A.D. 960-1908)

1.2.1. As Utterance Verbs Meaning 'say'
Similarly, in a number of stories written from the Song (A.D. 960-1278) to Qing Dynasties (A.D. 1644-1908), different forms of verbs of saying such as yan 'say', yue 'say', dao 'say' and shuo 'say' as shown in (8) to (13) are commonly used as utterance verbs meaning 'say' introducing a quote.

SDNJ

(8) Song-si-gong dao wo lihui de le. 
Song-si-gong say I understand PART PART 
'Song-si-gong says "I understand."'

(9) kuizi yue ni ji zhi qian duo hai ji. 
executioner say you already know money much harm self 
'The executioner says "Since you already know that too much money is dangerous to you ..."'

BYZLT

(10) Xu Xuan dao xiaozhi zhun lai. 
Xu Xuan say guy allow come 
'Xu Xuan says "You guys are allowed to come."'
(11) lao yuanwai **shuo** zhege rongyi. 
    old gentleman say this easy 
    'The old gentleman says "This is easy."'

HLM
(12) Yu Chun **dao** zheng shi. 
    Yu Chun say exactly be 
    'Yu Chun says "Exactly so!"'

(13) Ta **shuo** bi dei liang ge nuer pei zhe wo du shu. 
    he say must need two CL girl accompany I read book 
    'He says "I must be accompanied by two girls when I study."'

1.2.2. As Complementizers After Informative Verbs
Likewise, as illustrated in examples (14) to (18), **yue** or **dao** following another informative verb has lost its literal meaning in that the sentential complement expresses what has been answered, reported or called in an indirect way instead of what has been expressed verbally. In these sentences, **yue** or **dao** has developed into a complementizer.

   Certainly, the action of answering, reporting or calling must be involved with some kind of utterance either verbally or metaphorically. However, **dao** as in (15) can follow a verb **xie** 'write' which is not related to an actual utterance,

SDNJ
(14) lao ren da **yue** wu fei ren ye. 
    old man answer YUE I not human PART 
    'The old man answers "I am not a human."'

(15) jian shang xie **dao** Gushu cheng ren. 
    book on write DAO Gushu city people 
    'It is written in the book "The people inside the City of Gushu..."'

BYZLT
(16) zhuren chi le yi jing lianmang wen **dao** zuo shenme. 
    master eat ASP one surprise right-away ask DAO do what 
    'The master was surprised and immediately asked "What do you want?"'

(17) Xu Xuan jiao **dao** que shi ku ye. 
    Xu Xuan yell DAO yet be bad PART 
    'Xu Xuan yells "My goodness."'

HLM
(18) Bao Yu xiao wen **dao** Shenxian jiejie. 
    Bao Yu laugh ask DAO angel sister 
    'Bao Yu laughs and asks "Sister angel!"'
1.2.3. As Complementizers After Another Saying Verb
Paralleling example (3) at stage one, in (19) to (22), when yue or dao functions as
a complementizer and introduces a sentential complement, it occurs following
another verb of saying yan or shuo. Again, since two adjacent verbs of saying are
redundant and unnecessary, it turns out that the two items have different
functions: the first verb yan or shuo has a lexical function and serves as a main
verb in the main clause whereas the second verb yue or dao has a grammatical
function and serves as a complementizer to introduce a sentential complement.

SDNJ
(19) you ren kou chuan yan yue Ji Lun jiu wu ze ge.
      there-is someone knock boat say YUE Ji Lun save me PART PART
      'Someone knocked on the boat and said "Ji Lun, help me."'

(20) na laoer shuo dao laohan shi Song Gong dian cha de.
      that old-man say DAO old-guy be Song Officer order tea PART
      'That old man said "I am the tea server fro Officer Song."'

BYZLT
(21) si dui Zhang zhuguan shuo dao women dou yao heqi.
      privately to Zhang boss say DAO we all need friendly
      '...Privately talks to Mr. Zhang, the boss, "We all have to be friendly."'

HLM
(22) Yu Chun banri shuo dao yi ni zhenme zuo.
      Yu Chun half-day say DAO depend you how do
      'Ater a while, Yu Chun says "What will you do?"'

1.2.4. As Complementizers After Cognitive Verbs
At the later stage, a complementizer has extended its domain to occur not only
with saying and informative verbs, but also with cognitive verbs.

As illustrated in (23) to (26), dao in these sentences should be analyzed as a
complementizer for two reasons: First, dao has lost its literal meaning of ‘say’ in
that the sentential complement expresses what the subject has thought instead of
what s/he has verbally said. Further evidence comes from an example (24) in
which the context such as 'did not open his mouth but contemplated in his mind'
strongly implies that no utterance is involved. As for the cognitive verbs
preceding a complementizer, only xuns 'think', siliang 'think' or sichun
'contemplate' are found in all of these works.

SDNJ
(23) Lu Zhu zi si dao zhangfu bei ta wuhai xingming.
      Lu Zhu herself think DAO husband PASS s/he harm life
      'Lu Zhu herself thinks "My husband was killed by him."'
(24) Song Si Gong kou li bu shuo, du li siliang dao Zhao Zheng shou gao si wuo...
Song-si-gong mouth inside not say stomach inside contemplate DAO Zhao Zheng hand skillful like me
'Mister Song did not open his mouth but contemplated in his mind
"Zhao Zheng is as skillful as me ....""

BYZLT
(25) Xu Xuan xunsi dao wo ye wen ta yi wen.
Xu Xuan contemplate DAO I also ask him/her one ask
'Xu Xuan contemplates "Let me ask him/her."'

HLM
(26) Bao Yu xiang dao zhe ge difang youqu.
Bao Yu think DAO this CL place interesting
'Bao Yu thinks "This is an interesting place."'

1.3. Optional complementizers
Other evidence for analyzing dao as a complementizer is that dao in these contexts is optional. As shown in (27) to (30), in these examples a sentential complement is directly introduced by an informative verb such as wen 'ask' or jiao 'call', or a cognitive verb such as xunsi 'contemplate' or xiang 'think'.

SDNJ
(27) Wang Xiu you wen shifu zhe kezhang gao xing.
Wang Xiu again ask master this guest Polite last-name
'Wang Xiu asks his master again "May I have your last name?"'

(28) zhi ting de you ren jiao Zhao er guanren.
only hear PART there-is someone call Zhao two officer
'(I) only heard someone called "Officer Zhao ..."'

BYZLT
(29) Xu Xuan ziji xunsi zhen ge hao yi duan yinyuan.
Xu Xuan self contemplate really CL good one CL marriage
'Xu Xuan himself contemplates "It's really a good marriage. "'

HLM
(30) Dai Yu xin xiang zhe ge Bao Yu bu zhi shi zenyang ge pilan...
Dai Yu heart think this CL Bao Yu not know be how CL lazy
'Dai Yu thinks in her mind "I do not know how lazy this Bao Yu...."'
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Table (2) Frequency of Verbs before a Complementizer (Tang to Qing Dynasties)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
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<tr>
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<td>7th-10th cent.</td>
<td>10th-12th cent.</td>
<td>14th-17th cent.</td>
<td>17th-20th cent.</td>
</tr>
<tr>
<td>Utterance verbs</td>
<td>yan, yue</td>
<td>yan, yue, dao</td>
<td>yan, dao</td>
<td>shuo, dao</td>
</tr>
<tr>
<td>Complementizer</td>
<td>yan, yue</td>
<td>yan, yue, dao</td>
<td>dao</td>
<td>Dao</td>
</tr>
<tr>
<td>Frequency</td>
<td>freq. (%)</td>
<td>freq. (%)</td>
<td>freq. (%)</td>
<td>freq. (%)</td>
</tr>
<tr>
<td>Saying verbs</td>
<td>7 9.6</td>
<td>7 19.4</td>
<td>7 16.6</td>
<td>4 17.4</td>
</tr>
<tr>
<td>Informative verbs</td>
<td>66 90.4</td>
<td>23 64.0</td>
<td>30 71.4</td>
<td>12 52.2</td>
</tr>
<tr>
<td>Cognitive verbs</td>
<td>0 0.0</td>
<td>6 16.6</td>
<td>5 12.2</td>
<td>7 30.4</td>
</tr>
</tbody>
</table>

2. Verbs of Saying in Modern Chinese Dialects

In the remainder of the discussion I will use some data from Modern Taiwan Mandarin, Taiwanese, a Southern Min dialect spoken in Taiwan and Cantonese, to demonstrate the grammatical status of different uses of verbs of saying in Modern Chinese. There are several sources for the data for verbs of saying. The data in Taiwan Mandarin is collected from Taiwan's Electrical Mails News-Group Chat (BBS) in 1997. I have also used two books, one is entitled Bixu Ying de Ren [You have to Win] by Ji-Gao Zhang, and the other one is entitled Chutou Kaogu Xuejia de Zaji [An Archaeologist with a Hoe: A Note of Liji's life as a Scholar] by Guang-Muo Li. Some data in Taiwanese is collected from Taiyu Quwei Xuanji [Selection of Humor and Jokes in Taiwanese] edited by Robert Cheng. The data in Cantonese is primarily elicited from a native speaker of Hong Kong Cantonese, named K. C. Ma. She is from Hong Kong and is currently a graduate student in the Art department at the University of Hawaii, Manoa.

2.1. As Utterance Verbs Meaning 'say'

As shown in (31) to (32), when Mandarin shuo serves as an utterance verb meaning 'say', it can be marked for aspect such as le, zai or guo as the full verbs and retains the literal meaning of 'say'.

Mandarin

(31) Xianqian shuo le na zhong hua, shi ho you shuo
    previously say ASP that kind word afterwards again say
    'has previously said that kind of words and afterwards said that …'

(32) Ni zai shuo nimen xuexiang wo.
    You ASP say your school PART
    'Are you talking about your school?'

Paralleling Mandarin shuo 'say', Taiwanese kong and Cantonese wa 'say' as in examples (33) to (36) can serve as an utterance verb marked by aspect markers as full verbs and retain the literal meaning of 'say'.
Taiwanese
(33) I m bat **kong** koe petshat oe.
    he NEG used-to **say** ASP lie word
    'He has never told a lie.'

(34) Hakseng **kong**: 'm si goa m si goa ...'
    student **say** NEG be me NEG be me
    'A student said, "It is not me, it is not me ..."'

Cantonese
(35) Ngo mou **wa** kwo.
    I NEG **say** ASP
    'I have never said so.'

(36) Khue **wa** khui m sik wo.
    he **say** he NEG know PART
    'He said he did not know...'

2.2. As Cognitive Verbs Meaning 'think'
Mandarin **shuo**, as in (37) and (38), Taiwanese **kong** in (39) and (40) and Cantonese **wa** in (41) have all evolved into a cognitive verb with an abstract reading meaning 'to think' (Liu 1986; Meng 1982). On the basis of examples (37) to (41), Mandarin **shuo**, Taiwanese **kong** and Cantonese **wa** introducing a sentential complement should not be analyzed as utterance verbs meaning 'to say', but should be analyzed as cognitive verbs meaning 'to think' because the subject **you** or **I** does not verbally say anything. Instead, the reading of this sentence indicates that the speaker has assumed that what is introduced by **shuo** expresses the thought of the subject.

Mandarin
(37) Yexu ni hui **shuo** Taiwan yi zhongxiaq qiyue wei zhu.
    maybe you will **think** Taiwan take middle small company as primary
    'Maybe you will think that the majorities of business corporations are primarily small businesses in Taiwan.'

(38) Ni **shuo** ta congming ma?
    you **think** he smart Q
    'Do you think he is smart?'

Taiwanese
(39) Li **kong** goa au lepai khi Taipak ho m ho?
    you **think** I later week go Taipei good NEG good
    'Do you think it is okay for me to go to Taipei next week?'

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(40)   Goa kong li mai khi kha ho.
I think you NEG go more good
'I think you had better not go.'
Cantonese

(41)   Ngo wa dou m ji hai m hai keui tao ga je.
I think all NEG know COP NEG COP he steal PART PART
'I think I do not know whether he stole (it) or not.'
(example from Chui 1994)

2.3.   As Complementizers Following Saying and Informative Verbs
In examples (42) to (44), Mandarin shuo, Taiwanese kong and Cantonese wa have all evolved into complementizers introducing a sentential complement when they are preceded by an informative verb such as ask or answer. In these examples, shuo, kong and wa can neither be marked for aspect nor retain the literal meaning of 'say'. Similarly, the embedded sentence in these sentences indirectly expresses what the subject in the main clause has asked or answered. In addition, sentences, shuo, kong and wa in these sentences are all optional occurrences. Thus they should be analyzed as complementizers instead of utterance verbs.

Mandarin
(42)   Li Ji huida shuo (*le) meiyou ...
Li Ji answer SHUO (*ASP) NEG
'Li Ji answers "NO".'

Taiwanese
(43)   Ising huitap kong (*goe) :tsiN to ai tsunbi ho.'
doctor answer KONG (*ASP) money all must prepare in-hand
'The doctor answers (that), "The money must be in hand."
'(example from Cheng 1993)

Cantonese
(44)   John man ngo wa (*kwo) nisyu yau bouji.
John ask me WA where have newspaper
'John asks me where the newspaper is.'

2.4.   As Complementizers Following Cognitive Verbs
In these modern dialects, Mandarin shuo, Taiwanese kong and Cantonese wa as complementizers can follow a cognitive verb other than think.

For instance, in (45) shuo as a complementizer follows xiang 'think' and in (46) it follows guji 'estimate'. In (47) and (48) in Taiwanese, kong as a complementizer follows siuN 'think' and sionsgin 'believe'. In (49) and (50) in Cantonese, wa follows soeng 'think' and tsitou 'know'. For the same token, the embedded sentence in these examples indicates what has been thought, estimated, believed or known by the subject in the main clause. Again, shuo,
kong or wa in these sentences is an optional occurrence, thus it is a complementizer instead of a verb.

Mandarin
(45) Benlai hai xiang shuo (*le) ruguo ta jiang koshi de shiqing.
    originally still think SHUO (*ASP) if he OM oral-test POSS thing
    'Originally (I) still thought that if he handles the oral tests …'

(46) Hai you yi zhong guji shuo (*le) keneng yu shou yi wei tongxiang …
    still there-is one CL estimate SHUO (*ASP) maybe there-is accept one
    CL people-from-the same county
    'It was estimated that it might relate to someone from the same county …'

Taiwanese
(47) Hit le lang siuN kong (*koe) : 'hasi edang o tiu than tsiiN e honghoa …'
    that CL someone think KONG (*ASP) if be-able learn ASP earn money
    POSS way
    'That man thinks (that), "If (I) can learn the ways to make money …"'

(48) Goa sionsin kong (*koe) I iteng bo phien goa.
    I believe KONG (*ASP) he must NEG lie I
    'I believe that he did not lie to me.'

Cantonese
(49) Ngo soeng wa (*kwo) tse nei ke tinwa ta jat ha, tak ma?
    I think WA (*ASP) borrow you POSS telephone dial one CL O.K. Q
    'I think that I'd like to borrow your phone, may I?'

(50) John tsitou wa (*kwo) Mary hai Meihgwok laih ge.
    John know WA (*ASP) Mary be America come PART
    'John knows that Mary is from America.'

2.5. Taiwanese Kong as a Sentence-Final Particle
Taiwanese kong as in (51) has also evolved into a sentence-final particle which has no parallels in Mandarin and Cantonese. This kong as a sentence-final particle can only occur in declarative or imperative sentences but never in interrogative ones (Chen 1989).

(51) A Tiong si Taipak lang kong.
    A Tiong be Taipei person PART
    'A Tiong is from Taipei.'

3. Discussion
In classical Chinese, I showed that at the first stage, the complementizers only occur with saying, or informative verbs, but NEVER with cognitive verbs. At the
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later stage, a complementizer has extended its domain to occur not only with saying and informative verbs, but also with cognitive verbs. As for the cognitive verbs preceding a complementizer, only xunsi 'think', siliang 'think' and sichun 'contemplate' are found in all of these works.

However, in Modern Taiwan Mandarin, Taiwanese and Cantonese, a complementizer evolving from a saying verb can occur with other cognitive verbs like know, believe, decide or agree. Consequently, the historical development of reported speech in Chinese fulfills Givon's (1980) hypothesis.

Abbreviation

<table>
<thead>
<tr>
<th>ASP</th>
<th>CL</th>
<th>COP</th>
<th>PART</th>
<th>POSS</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspect</td>
<td>Classifier</td>
<td>Copular</td>
<td>Particle</td>
<td>Possessive</td>
<td>Question</td>
</tr>
</tbody>
</table>

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Texts


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A Local Treatment of Nonlocal Relativization in Korean

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1. Issues
One of the long standing issues in the analysis of Korean relative clause is how to treat relativization out of a double relative clause as given in examples like (1).¹

(1) a. \([NP[\_i_\_j\text{ tha-ko tani-num}]\text{ cha-ka}]\text{ mesci-n}]\text{ sinsa,}\)
   \(\text{ride drive-PN car-NOM stylish-PN gentleman}\)
   \("(\text{lit.})\text{ gentleman, who the car, that [he\text{\textunderscore i}] is driving is stylish}\"

b. \([NP[\_i_\_j\text{ kacko iss-nun}]\text{ khemphwute-ka}]\text{ MAC-i-n}]\text{ kyoswu}\)
   \(\text{in.possession-PN computer-NOM MAC-COP-PN}\)
   \(\text{professor}\)
   \("(\text{lit})\text{ professor, who the computer, that [he\text{\textunderscore i}] has is MAC}\"

In (1), the relative heads \(\text{sinsa 'gentleman'}\) and \(\text{kyoswu 'professor'}\) have been relativized out of complex NPs, violating the Complex Noun Phrase Constraint (CNPC). Such island violating cases have been the main reason for accepting either a base-generation approach or a genitive analysis (cf. Kang 1987).

Na and Huck (1993) provide a new analysis to account for cases like (1). They recapture such properties as subjacency violations through the application of their Argument Condition in (2) to the semantic interpretation of the constructions.²

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¹ I am grateful to Chan Chung, Sae-Youn Cho, Byung-Soo Park, Ivan Sag, Peter Sells, and the audience of the 25th BLS for their valuable comments and criticism. I also wish to acknowledge the financial support of the Korea Research Foundation in the program year of 1997. All errors and misinterpretations are, of course, mine.

² The abbreviations adopted in the paper are as follows: PN (Prenominal Modifier Marker), COP (Copula), NOM (Nominative), ACC (Accusative), DAT (Dative), LOC (Locative), PL (Plural), DECL (Declarative marker), COMP (Complementizer), GEN (Genitive), and PART (Particle).

² X is *thetically subordinate* to an entity Y iff Y's having the properties it does entails that X has the properties it does. Na and Huck (1993) classify this thematical subordination relation into five: *part-whole* (e.g., cover vs. book, voice vs. man), *quality-to-entity* (e.g., use vs. tool, color vs. eyes), *conventional* (e.g., car vs. man, dog vs. girl), *hierarchical* (e.g., parent vs. child, doctor vs. patient), and *taxonomic* (apple vs. fruit, chair vs. furniture) relation. These classifications are a central part of their analysis.
(2) The Argument Condition (Na and Huck 1993:200)
A relative clause must contain an element E that the clause predicates
something of, where E is either
A. A gap coindexed with the clause head; or
B. A nominal whose denotation is thematically subordinate to that of the
clause head.

Within this Argument Condition, examples like (1) are acceptable because of
Condition B, even though they violate subjacency restrictions: that is, there is a
'thematic (i.e. conventional) subordination' relation between the head sinsa
'gentleman' and the nominal cha 'car' in (1)a and between kyoswu 'professor' and
khempwute 'computer' in (1)b. The relationship between one nominal element
within the relative clause and the head NP thus determines the grammaticality of
subjacency violation cases. Na and Huck's analysis is insightful in factoring out
semantic and pragmatic factors of complicated Korean relative clauses as well as
in providing an account for language differences between English and Korean.

However, such an analysis is too restrictive to cover all nonlocal relatives.
One main problem it suffers from has to do with its focusing on just two nominal
elements involved. It appears that there are more than just these two nominals
involved in the formation of relative clauses:

(3) a. [[__i__j kapo-n cek-i eps-nun] talnala-ka]
go.see-PN perience-NOM non.ist-PN moon.country-NOM
kulwiw-un Tomi
miss-PN TOM
'Tomi, who misses the moon, where [he], has never been before.'
b. [[__i__j ticainha-n] phyoci]-ka tangsentyo-n ku haksayingi
  design-PN cover-NOM selected-PN the student
'(lit.) the student, who the cover, that [s/he], designed was selected'
  John-NOM write-PN novel-ACC Mary-DAT give-PN writer
  'the writer, who the novel, that [e], wrote John gave to Mary'

In the grammatical examples (3)a and (3)b, there is no conventional relation
between talnala 'moon' and 'Tom' or between phyoci 'cover' and haksaying
'student'. In contrast, the two nominals in (3)c are in a thematic subordination
relation but it is unacceptable. What we can observe from these examples is that it
is not just the relationship between the head noun of the relative clause and a
nominal element within it that determines the grammaticality of such cases. We
also need to look at phrases other than these two elements involved.

2. A Reinterpretation of the Data
If we look into the data that allow relativization from a relative clause, we can
notice that the highest verb in such cases is always the one that allows a multiple
nominative construction. For example, the verbs of the highest relative clause in
the grammatical examples of (1) and (3) all allow multiple nominative constructions as shown in (4).

(4) a. ku sinsa-ka cha-ka mesci-ta
    the man-NOM car-NOM stylish-DECL
    ‘The man’s car is stylish.’

    b. ku kyoswu-ka khemphwute-ka MAC-i-ta
    the professor-NOM computer-MON MAC-COP-DECL
    ‘The professor’s computer is MAC.’

    c. Tom-i talnala-ka kulipta
    Tom-NOM moon.country-NOM miss
    ‘Tom misses the moon (country).’

However, the situation is different with ungrammatical cases. The examples in (5) are cases that do not allow relativization of the lower subject:

(5) a. *[____] tulkoissa-nun] ai-ka pappu-n] wusan,
    holding-PN child-NOM busy-PN umbrella
    ‘(lit.) the umbrella that the child is holding is busy.’

    b. *[____] ilkessta-nun] chayk-i pissa-n] yeca,
    read-PN book-NOM pensive-PN woman
    ‘(lit.) the woman that reads the book is pensive’

    c. *[____] ilepeli-n] chayk-i simoha-n] Mary,
    lost-PN book-NOM delicate-PN Mary
    ‘(lit.) Mary who lost a book is delicate’

What is interesting is that none of the highest predicates in the relative clauses (5) allow multiple nominative constructions.

(6) a. *ku wusan-i ai-ka pappu-ta
    the umbrella-NOM child-NOM busy

    b. *ku yeca-ka chayk-i pissa-ta
    the woman-NOM book-NOM expensive

    c. *Mary-ka chayk-I simoha-ta
    Mary-NOM book-NOM delicate

The relativized phrase in such Korean nonlocal cases as (1) and (3)a and b seems to be the subject of the lower relative (cf. see Hasegawa (1984) for Japanese). Further, the head of the complex NP containing it serves as the subject of the higher clause. This is also the starting point of Na and Huck’s analysis.

However, my proposed analysis takes a different track: it claims that the top relativized phrase is coindexed with the subject of the highest relative clause, not with that of the lower relative clause. Within this approach, the traditional nonlocal relative clause in (7)a will have the structure (7)b:

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3 As hinted by the tree representation in (7)b, I assume that multiple nominative constructions are base generated without gaps (cf. Na and Huck 1993). As shown by Na and Huck (1993), there
(7) a. ssu-n sosel-i manh-un cakka
   write-PN novels-NOM many-PN writer
   ‘(lit.) writer, who the novels that [pro] wrote are many’

   b. 
   \[ S \rightarrow NP \]
   \[ NP \rightarrow NP_1 \]
   \[ NP_1 \rightarrow VP \rightarrow cakka_i \]
   \[ e_i \rightarrow NP_2 \rightarrow V \]
   \[ S \rightarrow N \rightarrow manh-un \]
   \[ NP_3 \rightarrow VP \rightarrow sosel-i_j \]
   \[ pro_i \rightarrow NP_4 \rightarrow V \]
   \[ e_j \rightarrow ssu-n \]

A major difference of my analysis from the previous ones, including Na and Huck's, is that the subject of the lower relative clause is a pro element coindexed with the subject of the highest verb (e_j) which is in turn coindexed with the relative head (cakka). Thus NP_1 and NP_2 are in the proposition that the writer's novels are many, whereas NP_3 and NP_4 are in the relation such that the writer pro wrote the novels.

One piece of evidence for assuming pro here comes from the possibility of replacing this pro with an overt pronominal or a reflexive which can occupy the subject position of an independent clause as illustrated in (8).

   the writer-NOM he-NOM/self-NOM write-PN novel many
   ‘The writer has many novels that he wrote.’

b. [[caki-ka/ku-ka ssu-n] sosel-i] manh-un cakka
   self-NOM/he-NOM write-PN novel-NOM many-PN writer
   ‘(lit.) writer who the novels that [himself] wrote are many.’

are problems in generating multiple nominative constructions from genitive clauses, in particular for cases which have no corresponding genitive sources:

(xix) a. Kkoch-un/i cangmi-ka olaykanta.
   flower-NOM roses long
   ‘As for flowers, roses last long.’

b. *Kkoch-uy cangmi-ka olaykanta
   flower-GEN rose-NOM long

Another main difference from genitive and multiple nominative cases lies in meaning differences with respect to the number of predications involved (see Na and Huck 1993).
One constraint that exists here is the coindex relation between this *pro* and the head NP₁, which we can expect from semantic constraints on multiple nominative constructions that require nominative NPs involved in a tight semantic relation (cf. Na and Huck 1993). It is hard to have a context violating this coindexation relation.

But if given a proper context, it is possible to violate this constraint. The examples in (9) illustrate that this *pro* position can be substituted by an unbounded pronominal.

   ‘(lit.) the writer who the novels that other people wrote in secret (for him) are many’

   ‘(lit.) the gentleman who the clothes John borrowed from him were torn up’

One desirable consequence of this analysis is that it can easily predict subject/object asymmetries given from (10) to (11).

(10) a. [[ip-un] yangpok-i] telew-un sinsa wear-PN suit-NOM dirty-PN gentleman
   ‘the gentleman whose suit that he is wearing is dirty’

b. *[[[ip-un] yangpok-ul] nay-ka po-n sinsa wear-PN suit-ACC I-NOM see-PN gentleman
   ‘(lit.) the gentleman whose suit that he is wearing I saw’

(11) a. [[ssu-n chayk-i] cal phallli-nun cakka write-PN book-NOM well sell.out-PN writer
   ‘the writer whose book sold well’

   ‘(lit.) the writer whose book he wrote John borrowed’

If we simply look at the relationship between the head noun and one nominal

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4 Huang's (1984) Generalized Control Rule ('coindex an empty pronominal with the closest nominal element') could be another way of accounting for this control relation: since *sosel₁-i* is coindexed with the *e₁*, it cannot be a potential antecedent. Then the control domain for *pro* will be the higher relative head noun.

5 There should be a certain conventional relation between two NPs, NP₁ and NP₂ in multiple nominative constructions. This relation is so strict that no expression that modifies the second NP can change this 'conventional' or 'thematic subordination' relation. If this changing process happens, we could no longer hold the conventional relation between the two, eventually generating a semantically anomalous sentence.
element in the relative clause as Na and Huck claim, we would predict the examples (10)b and (11)b to be grammatical. But in my analysis, they are ruled out since the highest predicates such as po-ta 'see' and pillyeka-ta 'borrow.away' do not allow multiple nominative constructions. The only possible source sentence of (10)b would be something like (12).

    gentleman-NOM wear-PN suit-ACC I-NOM see-PAST-DECL
    'I saw the suit that the gentleman wears.'

The relativization of the subject sinsa 'gentleman' from the lower clause thus violates the subjacency condition.

Further tests with more acceptable cases, borrowed from Na and Huck, support my claim that these types are the relativization of the first nominative NP of the multiple nominative constructions. As the data from (13) through (15) prove, all the acceptable nonlocal relatives have counterpart multiple nominative constructions:

(13) a. sal-ko-iss-nun aphatu-ka acwu khu-n chinkwu
    live-COMP-is-PN apartment-NOM very big-PN friend
    'the friend whose apartment he is living in is very big'
    b. chinkwu-ka aphatu-ka acwu khuta
    friend-NOM apartment-NOM very big
    'My friend's apartment is very big.'

(14) a. pom-hakki-ey kaluchi-l salam-i kyelcengtoy-n kwamok
    spring-term-in teach-PN person determined-PN course
    'the course such that the person who will teach [it] in spring term has been decided'
    b. ku kwamok-i salam-i kyelchentoyessta
    the course-NOM person-NOM determined

(15) a. chinha-n chinkwu-ka manh-un sonye
    close-PN friend many girl
    'girl who has many close friends'
    b. ku sonye-ka chinkwu-ka manhta
    the girl-NOM friend-NOM many

The merit of my analysis becomes clearer when compared with Na and Huck's analysis of examples (14) and (15). There is no subordinate relation between salam 'person' and kwamok 'course' in (14). The extra proposal that Na and Huck (1993) have to make for this case involves the claim that there exists a noun compound such as pomhakki-kangsa 'spring-term-instructor' as shown in (16).

(16) pomhakki-kangsa-ka kyelcengtoyn kwamok
    spring-term-instructor-NOM determined course
    'the course such that the spring-term-instructor has been decided'
What they claim is that a productive morphological process allows the compound pomahaki-kangska in (16) to be replaced by the relative clause (14)a pomhakki-ey kaluchi-l salam. It is rather a retreat from current practice to allow a morphological process to turn a compound into such a phrasal or sentential level element.

Another problem in Na and Huck (1993) arises from examples like (15): here again there is no subordinate relation between chinkwu 'friend' and sonye 'girl'. The escape hatch that Na and Huck introduce is to adopt the level of Full Interpretation with the representation given in (17).

\[(17) \ S [ e_i \ NP [ S [ e_i e_j \ a-nun] \ salam_j-i] \ manh-un] \ sonye_i \ know-PN \ person-NOM \ many-PN \ girl\]

In (17), the head noun $e_i$ in the embedded clause is first topicalized and then becomes the argument of the higher relative clause predicate manh-un 'many'. Thus the subject is no longer an argument of the lower clause predicate al-ta 'know'. This process then satisfies the syntactic condition of their Argument Condition A, stating that a gap in the relative clause should be coindexed with the relative head. But the question remains of what the applicable domain is of this syntactic process and how a topicalized element can turn into an argument of the higher predicate from the lower predicate.

Note that my analysis requires neither such a powerful morphological process that can look into syntax nor an escape hatch that allows an additional syntactic process to avoid a subjacency violation. The only thing we need to check out is whether the highest predicate allows a multiple nominative construction or not.

3. More on Nonlocal Relatives

3.1 Relativization from an embedded sentential complement clause

Another nonlocal type we can observe involves an element being relativized from an embedded sentential complement as given in (18).

\[(18) \ a. \ John-i \ [Mary-ka_i \ mekessta-ko] * (malha-n) sakwa_i \ \ John-NOM \ Mary-NOM \ ate-COMP \ say-PN \ apple \ 'the apple that John said Mary ate yesterday'\]
\[b. \ John-i \ [Mary-ka_i \ ilkessta-ko] * (mit-nun) chayk_i \ \ John-NOM \ Mary-NOM \ read-COMP \ believe-PN \ book \ 'the book that John believes Mary read'\]

If we simply rely on a semantic or pragmatic analysis such as that of Na and Huck's, an additional mechanism is required for cases like (18). According to their condition B, if there is a gap in the relative clause, it should be an argument of the higher predicate. However, the gaps in (18)a and (18)b are not. Na and Huck's (1993: 214-217) solution is to treat assertive predicates like malha-ta 'say' and mit-ta 'believe' as sentential modifiers, thus not counted as 'clause predicates'.

One immediate question of treating such assertive predicates as modifiers
comes from differences with English. Unlike English, Korean assertives in relative clauses are not optional as indicated by the star before the parentheses, mainly because they also carry the morphological information of pronominal modification. However, a syntactic analysis that allows the gap in the embedded clause to be locally visible to the head noun could provide a simple analysis. (19) is the tree structure of (18)a represented within the framework of HPSG. The analysis I adopt here is Sag's (1997) head-driven and traceless analysis of English relative clauses. Leaving aside the details, let me go through some of the main points in the analysis: the object of the embedded verb mek-ess-ta-ko is slashed (gapped). This information, at first passed up to the sentential level, is amalgamated into the lexical head malha-n 'say'. And this SLASH value is passed up to the higher VP and then to the top S, allowing the SLASH value and the head noun to be in the same local domain. No syntactic constraint is thus violated.

(19)

More complicated issues arise from cases like (20).

(20) a. [[____] ponay-n] salam-ul] nay-ka cimcakha-nun senmwul
    send-PN people-ACC I-NOM guess-PN gift
    'the gift such that I can guess who sent it'
    b. mikwuk-i [[pwukhan-i ____ kaypalha-n] kes-ulo]
    America-NOM N.Korea-NOM developed-PN thing-PART
    cwucangha-nun haykmwuki
    claim-PN nuclear.weapon
    'the nuclear weapon that America claimed North Korea had developed'

At first glance, examples like (20)a appear to be counterexamples to my analysis since the highest predicate cimcakha-ta 'guess' does not allow a multiple
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nominative construction.

Na and Huck's analysis also requires an explanation for cases like (20) since there is no thematically subordinate relation between salam 'person' and senmwul 'gift' or between haykmwuki 'nuclear weapon' and kes 'thing'. Further, the gaps are not in the higher clauses. Na and Huck (1993: 214-217) again resort to a modifier treatment of assertive predicates. One argument they provide for the modifier treatment is based on the assumption that 'the more material that is carried by the upper clause in the relative, the more difficult it becomes to interpret that clause as an adverbial modifier.' They claim this condition explains the unacceptability of sentences like (21) (Data from Na and Huck (1993)):

(21) a. *??[[Seyho-ka [e] ilk-un] kes-ulo] [sip-nyen-cen-ey
   Seyho-NOM read-PN thing-PART 10.years.ago
   chwucengtoy-n] capci
   surmise-PN magazine
   'the magazine which that Seyho read [it] was surmised 10 years ago.'

b. ??[[Seyho-ka [e] ilk-un] kes-ulo] [Mary-uy tongsayng-ey
   Seyho-NOM read-PN thing-PART Mary-GEN sister-LOC
   uyhayse chwucengtoy-n] capci
   by surmise-PN magazine
   'the magazine which that Seyho read [it] was surmised by Mary's sister'

According to their analysis, this 'modifier' (those parts including the assertive predicate) should be simple enough to interpret. However, notice that the amount of material in the upper clause does not determine absolute grammaticality, but is context-sensitive, as shown in (22).

(22) [[pwukhan-i [e] palsaha-n] kes-ulo]
   North.Korea-NOM shoot-PN thing-PART
   mi-kwukpengseng-i kicahoykyen-eye cwucangha-n misail
   Dept.-of-Defense-NOM news.briefing-LOC claim-PN missile
   'the missile that the Department of Defense claimed in a news briefing that
   North Korea had shot'

It seems that we need to find answers from a different perspective rather than from a semantic or pragmatic one. The solution I adopt here is a lexical specification on the complement of assertive predicates. One thing we can notice is that the assertive it cimcakha-ta 'guess' does not combine with a fully saturated NP as shown in (23).


Another solution that might be possible is to claim that nouns like salam and kes are clitic-like elements, and assertives select sentential complements.

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6 Another solution that might be possible is to claim that nouns like salam and kes are clitic-like elements, and assertives select sentential complements.
I-TOP gift-ACC send-PN the man-ACC guess
'(intended) I guess the man who sent the gift'
b. * [[__ ponay-n] ku salam-ul] nay-ka cimcakha-nun senmwul
   sent-PN the man-ACC I-NOM guess-PN present

I assume that an assertive predicate such as cimcakha-ta 'guess' or
cwucangha-ta 'claim' can select an unsaturated NP, N'. If we accept the constraint
that a fully saturated NP cannot have a SLASH value as a version of the
subjacency condition, we would allow the specifier-seeking N' to have a SLASH
value. This system then assigns the following structure to sentences like (20)b:

(24)

We can observe a contrast with other verbs that can select a fully saturated NP as
its subject. Verbs such as mit-ta 'believe' are such verbs. My analysis predicts that
in the relative clause with this verb, an element in the embedded clause cannot be
relativized across of the fully saturated NP. This prediction is borne out from the
elements given in (25).

   John-un gift-ACC sent-PN the man-ACC believed
   'John believed in the man who sent the gift (to him).' 
   b. * [__ ponay-n ku salam-ul] nay-ka mit-nun senmwul
      sent-PN the man-ACC I-NOM guess-PN gift

3.2 Relativization from an Adverbial Clause
Another type that seems to violate an island constraint involves cases where an
element is relativized from a modifier clause, as given in (26).⁷

⁷ A more canonical word ordering is the one where the adverbal clause is in the sentential initial...
(26) a. motwun haksayng-r-tul  [sensayngnim-i _ , ilkessul ttay]  
    all  student-PL-NOM  teacher-NOM  read when  
    wuless-ten phyenci,  
    cry-PN  letter  
    `(lit.) the letter, which all students cried when the teacher read _'  
    b. [ _ , cuwke-se] motwu-ka selphuha-nun salam,  
       dead-since all-NOM sad-PN  person  
    `(lit.) the person, who everyone cried because tri died'  

No satisfactory analysis has yet been given to account for such examples.  
However, once we accept an analysis where we place an adverbial element or  
clause in the same level as complements, as Bouma et al. (1998) proposed within  
the framework of HPSG, we can provide a simple analysis. For example, the  
intransitive verb wuless-ten `cried' can be realized as having an adverbial clause in  
its DEPENDENTS list in addition to its argument(s), as represented in (27).  

(27)  
  PHON wuless-ten  
  HEAD verb[MOD nominal]  
  SUBJ <[[NP[nom]>]  
  COMPS <[ ]>  
  DEPENDENTS <[[NP, ] [HEAD adv]]>  

Since we now have the sentential adverbial element as a complement, cases like  
(26) can be treated similar to relativization from a sentential complement. In both  
cases, the relativized element is in a sentential complement selected by the highest  
verb. This, in turn, means that relativization from an adverbial clause is not  
different from that of a sentential complement clause.  

Given this, (26)a will have the syntactic structure given in (28):  

(28)  
  NP  
    S[SLASH {4}]  
    NP  
    phyenci,  
    VP[SLASH {4}]  
    NP  
    motun haksayng-i  
    S-adv[SLASH {4}]  
    V[SLASH {4}]  
    sensayngnim-i _ ilkess-ul ttay  
    wuless-ten  

\* One could suggest that such examples involve parasitic gaps or the gap in the adverbial clause is  
pro. But issues seem to arise from cases like (26)b where there is no putative gap in the higher  
clause that could be coindexed with the head noun salam.
The predicate *ilkes-ul* 'read' in the adverbial clause allows its complement to be slashed. And this adverbial sentential clause can serve as the complement of the higher predicate *wules-s-ten* 'cried' so that the SLASH information is amalgamated into this lexical head. We then can pass the SLASH feature up to S thru the canonical SLASH Inheritance Principle. This will again avoid violation of any syntactic island conditions.

4. Conclusions
At first glance, we seem to have two types of Korean relatives; those that obey island constraints and those that do not. Careful examination, however, reveals that those nonlocal or double relatives are not really nonlocal but belong to local relatives. This implies that once we provide a clean analysis for canonical relatives, we can tend the analysis to the so-called double or nonlocal relatives.

In conclusion, flexible Korean relative clauses also observe basic syntactic restrictions such as subadjacency or other island constraints. We need not posit any further subconstructions for Korean relative clauses, allowing the grammar to be much simpler.

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Markedness and Pronoun Incorporation

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1. Introduction
It has long been noted in various studies in Bantu languages that certain types of object cannot be expressed as a pronominal object marker in a passive verb form. For example, in many Bantu languages a passive construction is ungrammatical in which a passivized inanimate subject cooccurs with a human object marker which is pronominal. In Kichaga (Bresnan and Moshi 1990) this is exemplified in (1).

(1) *K-êlyá k-ĩ-mi-lyi-ĩ-dô.¹
7-food 7S-PR-1O-eat-AP-PAS
‘The food is being eaten for/on him/her.’

However, an object can be expressed by a bound pronominal prefix incorporated into the passive form of the verb when the subject is higher in animacy than the object or when the animacy of the two arguments is equal.

In this paper I examine the pattern of selective pronoun incorporation, which I will call differential pronoun incorporation. In particular, I attempt to explain animacy-based gaps in the appearance of pronominal object markers in several Bantu languages within Optimality Theory (OT: Prince and Smolensky 1993). The analysis here draws crucially on hierarchy alignment as developed by Aissen (1999a) for the representation of morphosyntactic markedness hierarchies and on the theory of pronominal markedness developed by Bresnan (1998a,b, 1999) for the formal expression of conflicts of markedness and faithfulness. The ranking of markedness constraints derived through hierarchy alignment and faithfulness constraints derives the pattern of contextual neutralization and crosslinguistic variation found in differential pronoun incorporation systems in Bantu languages.

¹ I am grateful to Joan Bresnan, Peter Sells, Elizabeth Traugott and the audience at the 26th Meeting of the Berkeley Linguistics Society for useful comments, suggestions and discussion. I am also grateful to Lioba Moshi for her assistance with the Kichaga data cited here. This material is based upon work supported by the National Science Foundation under Grant No. BCS-9818077.

The Kichaga data in this paper were taken from Bresnan and Moshi (1990) or kindly provided by Lioba Moshi. I follow Bresnan and Moshi (1990) in the glossing of the Kichaga examples. The following abbreviations are used for grammatical categories in Kichaga: AP ‘applicative’, FOC ‘focus’, O ‘object’, OM ‘object marker’, PR ‘present’, PAS ‘passive’, PRO ‘pronoun’, PS ‘past’, S ‘subject’, SM ‘subject marker’.
2. Differential Pronoun Incorporation in Bantu

Kichaga, an example of a symmetrical object language (in the terminology of Bresnan and Moshi 1990), allows both objects in a double object construction to manifest primary or unrestricted object properties at once.² For example, when one object is passivized, the other may be pronominalized, and thus expressed by an object marker which is a bound pronominal incorporated into the verb, as (2) illustrates.

(2) M-kà n-ÿ-i-kì-lyì-f-ò. (OMₚᵢ-Vₚₐₛ)
    1-wife FOC-1S-PR-7o-eat-AP-PAS
    ‘The wife is being benefited/adversely affected by someone’s eating it.’

While it is possible to express either or both of the objects in a double object construction in the active by means of an incorporated pronoun, however, certain types of objects cannot be expressed as an incorporated pronoun in a passive verb form.³ The facts governing object pronoun incorporation in passives are rather complex, determined by the relative animacy and topicality of passivized subjects and objects. In Kichaga, an object cannot be expressed as a pronominal object prefix when a passivized subject is lower in animacy, and it is non-topic, hence expressed by a full lexical NP.⁴ This is illustrated in the examples in (3)–(5). The subject marker functions as a non-referential marker of grammatical agreement, with a cooccurring NP required to fulfill the subject function of the verb.

(3) SUBJ: inanimate; OBJ: human (S<Ø in topicality, S<Ø in animacy)
    °K-èlyá k-ï-mì-lyì-f-ò. (NP SM-OM-Vₚₛₐₛ)
    7-food 7S-PR-10-eat-AP-PAS
    ‘The food is being eaten for/on him/her.’

---

² In asymmetrical object languages, in contrast, only one argument at a time can have primary or unrestricted object properties (Baker 1988; Bresnan and Moshi 1990; Alsina and Mchombo 1993). For example, if one argument is passivized, the other cannot be object marked. Of course, the typology of object asymmetries is not just a bipartite typology, consisting only of the symmetrical and the asymmetrical types, but includes further subtypes. See Alsina (1993) for a detailed discussion of the typology of object asymmetries.

³ In asymmetrical object languages object markers, both pronominal and nonpronominal, never appear on a passive verb. This is because both the passive subject and the object marker must correspond to unrestricted arguments. Asymmetrical object languages do not allow an argument structure to include more than one unrestricted argument, and thus a passive verb form fails to allow object agreement. This paper is concerned only with symmetrical object languages and nothing will be said about the problem of explaining the absence of an object marker with the passive in asymmetrical languages.

⁴ The same animacy restriction appears with unaccusative applicative verbs with two internal arguments in Kichaga (Lioba Moshi, p.c., April 2000). That is, when an object of an unaccusative applicative verb is higher on the animacy hierarchy than its subject, the former cannot be expressed as an object marker which is pronominal.

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(4) **SUBJ**: inanimate; **OBJ**: animate (S< O in topicality, S< O in animacy)
* Kɛ́-lɛ́-lɛ́-lɪ́-ɪ́-d̪̊. (NP SM-OM-V< \text{PAS})
  7-food 7S-PR-O-eat-AP-PAS
  ‘The food is being eaten for it (i.e., goat).’

(5) **SUBJ**: animate; **OBJ**: human (S< O in topicality, S< O in animacy)
* Mbù-rù y-ɪ́-mɪ́-lɪ́-ɪ́-d̪̊. (NP SM-OM-V< \text{PAS})
  9-goat 9S-PR-1O-eat-AP-PAS
  ‘The goat is being eaten for him/her.’

However, an object can be expressed by an incorporated bound pronominal in passives when the subject is higher in animacy than the object as in (2) above or when their animacy is equal as in (6a) and (6b).

(6a) **SUBJ**: human; **OBJ**: human (S< O in topicality, S=O in animacy)
  M-ànà n-à-ɪ́-mɪ́-lɪ́-ɪ́-d̪̊. (NP SM-OM-V< \text{PAS})
  1-child FOC-1S-PR-1O-eat-AP-PAS
  ‘The child is being eaten for him/her.’

(6b) **SUBJ**: inanimate; **OBJ**: inanimate (S< O in topicality, S=O in animacy)
  Kù-zrəndɛ́ kù-1ɛ́-kɪ́-réng-ɪ́-d̪̊. (NP SM-OM-V< \text{PAS})
  15-leg 15S-PS-carve-AP-PAS
  ‘The leg was being carved for it (i.e., the chair).’

The examples in (3)–(5) become good if the subject is also topical (e.g., continuing topic or contrastive focus).\(^5\) Note, in contrast to the subject marker in the examples above, that in (7a) and (7b) below it serves as an incorporated pronominal fulfilling the subject function; the external coreferential NP, anaphorically bound to the pronominal subject marker, has a non-argument function as a contrastive focus (7a) and a topic (7b). The tonal difference on the NP cooccurring with the pronominal SM indicates the non-local property of anaphoric agreement (Bresnan and Mchombo 1987: 752-756). (Note that the NP in (7a) differs from that in (3) tonally.)

---

\(^5\) The topic designates what is under discussion, whether previously mentioned or assumed in discourse (Bresnan and Mchombo 1987: 746). This characterization is not meant as a definition. For reasons of space, I will not discuss how the term ‘topic’ should be defined, but assume that topics can be distinguished from non-topics in terms of a set of testable criteria for topichood (e.g., the ‘referential distance’ measurement, the ‘topic persistance’ measurement, incompatibility with pragmatic focus, etc.), proposed by Givón (1983) and by Bresnan and Mchombo (1987). Contrastive focus as well as topic has the same discourse properties that have been taken as defining properties of discourse topics: both topic and contrastive focus involve some presupposed alternatives (Dik et al. 1981: 42); they both possess the high degree of ‘context-construability’, which is defined by Rochemont and Culicover (1990: 20) to be ‘under discussion’ or to ‘have a semantic or discourse antecedent in the discourse’.
(7) a. **SUBJ: contrastive focus, inanimate; OBJ: topic, human**
(S=<O in topicality, S=<O in animacy)
K-ělyá, k-ī-m-liyi-i-ô. (CFOC, SM-OM-V_{PAS})
7-food, 7S-PR-1O-eat-AP-PAS
‘The food is being eaten for/on him/her.’

b. **SUBJ: topic, inanimate; OBJ: topic, human**
(S=<O in topicality, S=<O in animacy)
K-ī-m-liyi-i-ô. (SM-OM-V_{PAS})
7S-PR-1O-eat-AP-PAS
‘It (i.e., the food) is being eaten for/on him/her.’

Another situation where the animacy restriction disappears is when the object marker doubles a free pronoun object, used for emphasis or contrast.\(^6\)

(8) **SUBJ: inanimate; OBJ: emphatic focus, human** (S=<O in animacy)
K-ělyá k-ī-m-liyi-i-ô dô.\(^7\) (NP SM-OM-V_{PAS} PRO)
7-food 7S-PR-1O-eat-AP-PAS ṭPRO
‘The food is being eaten for /on him/her.’

The pattern of differential object pronoun incorporation in Kichaga is summarized in (9).

(9) Table 1. Differential Object Pronoun Incorporation in Kichaga

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>Human</th>
<th>Animate</th>
<th>Inanimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inanimate, Top−</td>
<td></td>
<td>X</td>
<td>X</td>
<td>C</td>
</tr>
<tr>
<td>Inanimate, Top+</td>
<td></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Animate, Top−</td>
<td></td>
<td>X</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Animate, Top+</td>
<td></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Human, Top−</td>
<td></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Human, Top+</td>
<td></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
</tbody>
</table>

(C: Contrast of Free/Reduced pronouns in object; X: No contrast in object (Free pronoun objects only))

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\(^6\) In Kichaga prefixal pronouns incorporated into the verb are the normal anaphoric means of referring to topical entities, while free pronouns are used to establish a new topic or for giving emphasis.

\(^7\) Bresnan and Moshi (1990: 151) note that all object markers in Kichaga have the obligatory pronoun-doubling property: when the NP object is an independent pronoun, the object marker obligatorily cooccurs with it. Following Bresnan and Mchombo (1987) and Bresnan and Moshi (1990), I assume that the doubling object marker is a marker of grammatical agreement, and the non-doubling object marker is an incorporated pronoun showing anaphoric agreement with a topic.
Markedness and Pronoun Incorporation

We see that the contrast of free and reduced pronouns is freely realized in most contexts, but it is avoided in objects occurring in three marked contexts. This pattern can be seen as an instance of positional neutralization: the contrast of free and reduced pronouns, even if otherwise preferred in the language, is neutralized to the unmarked free pronoun in the most marked object types, namely when objects are more prominent than subjects in both animacy and topicality.

The descriptive generalization that emerges from this pattern is clear:

(10) **Generalization:** An object pronoun cannot be incorporated into a passive verb form when the passivized subject is less prominent in animacy, and it is non-topical, hence expressed by a lexical NP. Only free pronouns can express such objects.

The Kichaga pattern is not arbitrary, but rather a manifestation of universal markedness relations. Cross-linguistically, the unmarked situation is for the subject to be a nominal which is human/animate and topical. The unmarked situation for the object is the reverse: objects prefer to be inanimate and non-topical. Therefore, it is more marked for a subject to be inanimate and non-topical rather than human and topical, and for an object to be human and topical rather than inanimate and non-topical. So the following questions emerge from the pattern of differential object pronoun incorporation: (i) how can such seemingly unusual effects of prominence hierarchies on pronoun incorporation be incorporated into theories of universal grammar in a way that accounts for the universal basis of differential pronoun incorporation and at the same time permits for the range of language-particular variation? and (ii) how is it possible to express that the contrast of free/reduced pronouns is neutralized in objects, while preserved in passivized subjects?

3. An OT Account of Differential Pronoun Incorporation

3.1 Harmonic Alignment and Markedness Constraints

The overall situation in the phenomenon of differential pronoun incorporation is characterized by markedness reversal (Croft 1990; Battistella 1990): high prominence on the dimensions of animacy and topicality is unmarked for subjects. What is unmarked for subjects is marked for objects.

The formal mechanism that derives markedness reversal in OT is harmonic alignment of prominence scales, which was developed in Prince and Smolensky (1993) within their account of syllable structure. The formal definition of harmonic alignment is given in (11).
Harmonic Alignment (Prince and Smolensky 1993: 136)
Suppose a binary dimension $D_1$ with a scale $X > Y$ on its element $\{X,Y\}$, and another dimension $D_2$ with a scale $a > b > \ldots > z$ on its elements. The harmonic alignment of $D_1$ and $D_2$ is the pair of Harmony scales:

- $H_x$: $X/a > X/b > \ldots > X/z$
- $H_y$: $Y/z > \ldots > Y/b > Y/a$

The constraint alignment is the pair of constraint hierarchies:

- $C_x$: $*X/z \gg \ldots \gg *X/b \gg *X/a$
- $C_y$: $*Y/a \gg *Y/b \gg \ldots \gg *Y/z$

Harmonic alignment of two prominence scales associates the high-ranking elements on the two scales (e.g. vowels with peaks), as well as the low-ranking elements on the two (obstruents with margins). Thus the definition of harmonic alignment above formalizes the idea that elements on the high end of one prominence scale tend to occur together with elements on the high end of another scale, while elements on the low end of one scale tend to align with the low end of the other. Aissen (1997a, 1999a,b) proposes that the phenomenon of harmonic alignment is not limited to phonology, but also occurs in various morphosyntactic systems. Here the relevant dimensions are grammatical function (GF), animacy and topicality.

If the GF and animacy hierarchies (12) are harmonically aligned, we obtain the pair of harmony (markedness) scales in (13):

(12) Universal scales
- a. GF Scale: SUBJ(ECT) > OBJ(ECT)
- b. Animacy Scale: Hum(an) > Anim(ate) > Inan(imate)

The hierarchies in (13) express the idea that human subjects are (universally) less marked than inanimate subjects; and conversely, that inanimate objects are (universally) less marked than human objects.

(13) Harmony (markedness) scales:
- a. SUBJ/Hum > SUBJ/Anim > SUBJ/Inan
- b. OBJ/Inan > OBJ/Anim > OBJ/Hum

Markedness of inanimate subjects and animate objects is seen in languages like Tzotzil and Chamorro, where clauses with inanimate subjects and animate objects are avoided (Chung 1984; Cooreman 1987; Aissen 1997b, 1999b). Inverting the hierarchies in (13) and prefixing the Avoid operator ("*") yields the constraint subhierarchies in (14):

(14) Constraint subhierarchies:
- a. $*\text{SUBJ}/\text{Inan} \gg *\text{SUBJ}/\text{Anim} \gg *\text{SUBJ}/\text{Hum}$
- b. $*\text{OBJ}/\text{Hum} \gg *\text{OBJ}/\text{Anim} \gg *\text{OBJ}/\text{Inan}$
Markedness and Pronoun Incorporation

The subhierarchy in (14a) expresses the fact that given the choice between expressing a proposition through a clause with an inanimate subject or through a clause with a human subject, all other things being equal, the clause with a human subject will be universally preferred. (14b) has analogous effects.

As a further application of harmonic alignment, consider the GF and topicality scales in (15). Harmonic alignment yields the harmony scales in (16) and the corresponding constraint subhierarchies in (17).

(15) Aligning GF with topicality
   a. GF Scale: SUBJ(ECT) > OBJ(ECT)
   b. Topicality: TOP(IC) > Non-TOP(IC)

(16) Harmony (markedness) scales:
   a. SUBJ/ TOP > SUBJ/~TOP
   b. OBJ/~TOP > OBJ/TOP

Markedness of non-topical subjects is seen in languages like Sesotho and Setawana, where non-topical subjects are avoided (Demuth and Johnson 1989; Demuth 1989); markedness of topical objects is seen in languages like Malay, in which such objects surface through non-canonical structures such as object preposing structures when they cooccur with non-topical subjects (Tham 2000).

(17) Constraint subhierarchies:
   a. *SUBJ/~TOP > *SUBJ/TOP
   b. *OBJ/TOP > *OBJ/~TOP

In (17a) the ranking of *SUBJ/~TOP over *SUBJ/TOP means that in the absence of any relevant higher ranking constraints, a clause with a non-topic subject will lose out in direct competition to a clause with a topic subject. (17b) has analogous effects. The ranking of constraints in each subhierarchy is universally fixed, and expresses the universal markedness relations in this domain. Language-particular variation can be described through the interpolation of other constraints among those in a subhierarchy, but not through differences in ranking within the subhierarchy itself (Aissen 1999a: 12-13).

As noted in section 3, languages like Kichaga exclude clause types which are marked both with respect to grammatical function and animacy, and with respect to grammatical function and topicality. Thus this account requires constraints which characterize what the most marked clause types with respect to these dimensions. The intuition that having two marked structures within a single domain can result in a configuration that is more marked than having either of the marked structures alone is captured by the formal operation of local conjunction proposed in Smolensky (1995): The first step is to show that an argument which is marked in two respects should be assessed as more marked than one which is marked in one respect. This is done through local conjunction of the highest

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8 The Local Conjunction of C₁ and C₂ in domain D, C₁ & C₂, is violated when there is some domain of type D in which both C₁ and C₂ are violated (Smolensky 1995).
constraints in (17) (*SUBJ/~TOP and *OBJ/TOP) with subhierarchies in (14) involving alignment of grammatical function with animacy. When a subhierarchy locally conjoin with a markedness constraint, the ranking of the resulting subhierarchy is predetermined by that of the input subhierarchy. This property of ranking preservation is stated by Aissen (1999a) as follows:

(18) The local conjunction of C₁ with subhierarchy [C₂ ⊃ C₃ ... ⊃ Cₙ] yields the subhierarchy [C₁ & C₂ ⊃ C₁ & C₃ ... ⊃ C₁ & Cₙ].

From this we form complex subhierarchies composed of constraints that refer to both the animacy and topicality of arguments. The subhierarchies which locally conjoin with *SUBJ/~TOP and *OBJ/TOP are listed in the left column of (19); the subhierarchies which result from local conjunction are listed in the right column. Per (18), the rankings of the resulting subhierarchies on the right are all predetermined by those of the subhierarchies on the left.

(19) Table 2. Local conjunction of constraints

<table>
<thead>
<tr>
<th>Subhierarchies involving GF/Anim</th>
<th>Conjunction of subhierarchies (GF/Anim) with constraints (GF/TOP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*SUBJ/Inan »</td>
<td>*SUBJ/Inan &amp; *SUBJ/~TOP »</td>
</tr>
<tr>
<td>*SUBJ/Anim »</td>
<td>*SUBJ/Anim &amp; *SUBJ/~TOP »</td>
</tr>
<tr>
<td>*SUBJ/Hum</td>
<td>*SUBJ/Hum &amp; *SUBJ/~TOP</td>
</tr>
<tr>
<td>*OBJ/Hum »</td>
<td>*OBJ/Hum &amp; *OBJ/TOP</td>
</tr>
<tr>
<td>*OBJ/Anim »</td>
<td>*OBJ/Anim &amp; *OBJ/TOP</td>
</tr>
<tr>
<td>*OBJ/Inan</td>
<td>*OBJ/Inan &amp; *OBJ/TOP</td>
</tr>
</tbody>
</table>

While a simple constraint like *SUBJ/Inan will assign a violation to any inanimate subject, the conjoined constraint [*SUBJ/Inan & *SUBJ/~TOP] will assign a violation only to a non-topical inanimate subject, which is realized as a full NP or as an independent pronoun in Bantu languages. Thus I have shown that what the most marked types of arguments are. But this is not enough. Since the subhierarchies in (19) only assess the markedness of a single argument, to determine the markedness of structures with two arguments, next we need to construct constraint subhierarchies composed of both of the rankings in the right column of (19).

Applying the schema for conjoining two subhierarchies (see Aissen (1999a), fn. 20) to the two subhierarchies on the right of (19), we get the partial ordering in (20), which assess the markedness of both the subject and object.⁹

⁹ In fact, the constraints needed here must be such that they rule out expressing marked object types as a bound pronoun only in a clause containing a patient subject such as passive or unaccusative constructions. It is possible to devise more complex constraints restricted to clauses with a patient subject by conjoining the constraint *SUBJ/pt (avoid a patient subject) with the constraints in (20). Though the conjoined constraints in this paper should be understood as involving further conjunction with *SUBJ/pt, I will not indicate this for ease of presentation.
Figure 1. Conjunction of the two subhierarchies in (19)
(*GF/Anim&*GF/TOP is written as *GF-Anim/TOP)

S< O(Anim)
a. [*SUBJ-Inan/~TOP] & [*OBJ-Hum/TOP]

S= O(Anim)

S> O(Anim)

The sets of constraints shown in (20) express the relative markedness of all combinations of subject and object with respect to their anincies in a context where the subject is topic and the object is non-topic. The most marked situation is to have the non-topic subject lower in animacy than the topical object. The maximally marked clause types expressing this situation are exactly the configuration in the Kichaga data that is ungrammatical, and will be penalized by the constraints labeled (a) and (b) in (20); the least marked situation, penalized by the constraints labeled (d) and (e) in (20), is to have the non-topic subject higher in animacy than the topical object.

I will abbreviate the groups of constraints in (20) as shown below in (21) due to space limitations.


3.2 Conflict of Markedness and Faithfulness
Now consider how the markedness constraints derived through harmonic alignment and local conjunction interact with other constraints that play a role in pronominal systems. Those that are relevant for the present discussion are given in (22) and (23). The constraint in (22), proposed by Bresnan (1998a,b, 1999), is one instance of constraints on faithfulness to pronominal features in the input (PRO, AGR, TOP), which require these features to be preserved in the output pronominal expression. Opposing this faithfulness constraint is the markedness constraint in (23), also taken from Bresnan (1998a,b, 1999). This constraint
expresses the syntactically marked status of reduced pronominals (zero, bound, clitic or weak) from the point of view of iconicity and the avoidance of allotaxy.

(22) FAITH(TOP): Pronominal topicality feature in the input must be expressed by pronominal forms specialized for topic anaphoricity in the output form.

(23) *RED[PRO]: Avoid reduced expression of pronominals.

The constraints introduced so far are ranked in the following way in Kichaga:

(24) Ranking for Kichaga:
*S/~TOP<0/TOP(Anim) » FAITH(TOP) » *RED[PRO], *S/~TOP≥0/TOP(Anim)

The ranking of FAITH(TOP) above *RED[PRO] yields a pronominal inventory consisting of both reduced and free pronouns. Under this ranking the reduced form will be optimal for expressing topical content; the free pronoun remains optimal elsewhere (Bresnan 1998a,b, 1999). However, due to the high ranking markedness constraints, derived through hierarchy alignment and local conjunction, the contrast of free/reduced pronouns, even if preferred in the language elsewhere, will be avoided in highly marked objects (human objects) in the maximally marked clause types (clauses with non-topical inanimate subjects).

The consequences of this ranking are summarized in (25) and (26). As input to the evaluation module, I assume a predicate-argument structure, argument prominence, and a representation of morphosyntactic information, following Legendre et al. (1993), Aissen (1999a) and Sells (1999). In languages like English and the Bantu languages under discussion here, the passive is a better choice than the active when the patient (internal argument) is more prominent than the agent. The evaluation of a clause with a prominent beneficiary and theme (indicated in the input as BEN and TH respectively) and a non-prominent agent (indicated as ag) is shown in (25). Though active and passive clauses compete against each other in the universal candidate set (Legendre et al. 1993, Aissen 1999a, Sells 1999), I have omitted active candidates in the tableaux below for simplicity.

(25) Tableau 1. Differential object pronoun incorporation in Kichaga

<table>
<thead>
<tr>
<th>Input: BEN: [TOP, HUM, PRED: 'PRO']</th>
<th>TH: [INAN, PRED: 'food']</th>
<th>*S/~TOP&lt;0/TOP(Anim)</th>
<th>FAITH (TOP)</th>
<th>*RED [PRO]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. *NP_SUBJ SM_TH/INAN^OM[PRO]/BEN/HUM-V_PAS</td>
<td>ag</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'The food is being eaten for him/her.'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. SM[PRO]/BEN/HUM-V_PAS NP_TH/INANOBJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. NP_SUBJ SM_TH/INAN^OM_BEN/HUM-V_PAS PROOBJ</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>

In (25), candidate (a) is ruled out, due to the high ranking conjoined markedness constraint that penalizes an non-topical inanimate subject with a topical human object, expressed as an incorporated bound pronoun. This highly marked configuration requires an alternative passive construction available in symmetrical
Markedness and Pronoun Incorporation

object languages like Kichaga, that is, one that has a human reduced pronoun as a subject and an inanimate lexical NP as an object. Hence, candidate (b) is the optimal output that best satisfies the high-ranked constraints. For non-topical content, a candidate like (c) with the free pronoun object, unspecialized for topic anaphorically, becomes optimal under the same ranking; see (26).

(26) Tableau 2. Emergence of the unmarked pronoun in non-topical content

<table>
<thead>
<tr>
<th>Input: BEN: [HUM, PRED: ‘PRO’]</th>
<th>TH: [INAN, PRED: ‘food’]</th>
<th>*S/~TOP&lt;0/TOP(Anim)</th>
<th>FAITH (TOP)</th>
<th>*RED [PRO]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. *NP_SUBJ SM_TH/INAN<del>OM [PRO]/BEN/HUM</del>V_PAS ag</td>
<td>‘The food is being eaten for him/her.’</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. SM_PRO/BEN/HUM~V_PAS NP_TH/INAN_OBJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. *NP_SUBJ SM_TH/INAN<del>OM [PRO]/BEN/HUM</del>V_PAS Pro_OBJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.3 Crosslinguistic Variation in Differential Pronoun Incorporation

There is considerable variation in the strategies or factors influencing which pronominal arguments will be incorporated into a verb. For example, in Logooli, a dialect of Luhya, the animacy of arguments plays no role (Morolong and Hyman 1977; Hyman and Duranti 1982): a human pronoun can be freely incorporated into the passive form of a verb even when the subject is not human; in Sesotho (Morolong and Hyman 1977; Artstein 1998) no types of pronoun object can be incorporated into a passive verb form taking an inanimate subject irrespective of the topicality of subject; in Haya (Duranti and Byarushengo 1977: 66-68), a human object pronoun cannot be expressed as a pronominal object prefix when the passive subject is nonhuman regardless of the topicality of subject. The constraints needed to characterize the differential pronoun incorporation patterns in these languages are derived by local conjunction of the subhierarchies on the animacies of the subject and object and object topicality:

(27) Table 3. Subhierarchy on object pronoun incorporation based on animacy and topicality

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object: TOP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Human</td>
</tr>
<tr>
<td>Inanimate</td>
<td>*S/Inan &amp;</td>
</tr>
<tr>
<td></td>
<td>*O-Hum/TOP</td>
</tr>
<tr>
<td>Animate</td>
<td>*S/Anim &amp;</td>
</tr>
<tr>
<td></td>
<td>*O-Hum/TOP</td>
</tr>
<tr>
<td>Human</td>
<td>*S/Hum &amp;</td>
</tr>
<tr>
<td></td>
<td>*O-Hum/TOP</td>
</tr>
</tbody>
</table>

dominate FAITH(TOP) in Haya
The figure in (28) shows that interpolation of FAITH(TOP) above the constraints of (27) or between these results in different object pronoun incorporation systems. Promotion of FAITH(TOP) above all the markedness constraints introduced so far, for example, yields a language like Logooli, in which either free or incorporated pronouns can express a human object even in highly marked passive clauses with an inanimate subject. The demotion of FAITH(TOP) admits the neutralization of the free/reduced contrast in less marked situations. For example, ranking FAITH(TOP) between the constraints penalizing nonhuman subjects on the leftmost column of (27) and other constraints in (27) yields, a system in which the contrast of free/reduced pronouns is neutralized to the free pronoun in human objects when the (patient) subject is nonhuman, exactly the Haya system. Sesotho can be described by interpolating FAITH(TOP) between the constraints on the top row of (27), which exclude an inanimate subject, and other constraints in (27). Lastly, the ranking with all markedness constraints above FAITH(TOP) yields a system in which only free pronouns can express all argument types.

(28) Figure 2. Interpolation of FAITH(TOP) in the subhierarchies from (27)

\[
\begin{array}{|c|}
\hline
\text{FAITH(TOP)} & \text{[Logooli, full contrast]} \\
\text{[\text{*SUBJ*/-Hum/]} & \text{[\text{*OBJ/-Hum/TOP}]}
\hline
\text{FAITH(TOP)} & \text{[Haya, positional neutralization in human objects when the subject is nonhuman]} \\
\text{[\text{*SUBJ*/Inan/]} & \text{[\text{*OBJ/TOP}]}
\hline
\text{FAITH(TOP)} & \text{[Sesotho, positional neutralization in objects when the subject is inanimate]} \\
\text{\text{*RED/PRO} & \text{\text{FAITH(TOP) [Widespread, no contrast]}}
\hline
\end{array}
\]

A prediction that follows from the constraint interaction shown above is that no language can have the contrast of free and reduced pronouns exclusively in the context where a context-sensitive markedness constraint bans reduced pronouns, for example, in human objects. This seems to be correct, although further testing is required. Alternative theories which do not assume markedness to be the actual substance of the grammar would fail to derive this general prediction.

4. Conclusion
I have shown that the OT theory of markedness expresses the intuition that the more subject-like the object is, the less likely it is to be expressed by reduced pronominals, which are topic-oriented. This theory not only accounts for the universal basis of differential pronoun incorporation, but also permits for the range of language-particular variation that is observed.

In other symmetrical Bantu languages differential animacy is not a conditioning factor in differential object pronoun incorporation systems, and other
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restrictions such as thematic prominence are operative. For example, in Kinyarwanda (Kimenyi 1980), Runyambo (Alsina 1994; Rugemalira 1993) and SiSwati (De Guzman 1987), the thematically higher of arguments (e.g. beneficiary) cannot be expressed as an OM in a passive form and can only be realized as a subject. This fact can be analyzed as reflecting a constraint which penalizes object pronoun incorporation when the object is more prominent than the subject at the level of argument structure.

The inability of certain argument types to be expressed as an OM in a passive, which seems to indicate that symmetrical object languages may have an asymmetrical passive, has been analyzed as relating to a property of the passive morpheme in pre-OT generative grammar (e.g. Woolford 1993). Space limitations prevent me from discussing this morpheme-based approach to object marking in a passive and contrasting it with the current approach, which treats the same phenomenon as a manifestation of a more general property of the grammatical system, i.e., markedness. However, the main difference between the two approaches becomes obvious once we take into account other related facts discussed in the present paper – the same pattern in object marking in passives and unaccusative verbs with two internal arguments in languages like Kichaga, and the animacy factor in pronoun incorporation. The facts about differential pronoun incorporation in languages outside the Bantu family will also help us decide which of the two approaches is to be preferred.

References


Markedness and Pronoun Incorporation


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Syntactically-based Lexical Decomposition: The Case of Climb Revisited*

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1. Introduction. Jackendoff's conceptual analysis of climb
The main purpose of this paper is to show the theoretical and empirical plausibility of an approach to argument structure which involves a minimal lexical-syntactic decomposition analysis of predicates. In doing so, I will also take pains to show the problems of drawing argument structures from pure, non-linguistic conceptual structures. In particular, I will be dealing with cases involving multiple argument structures, which will be analyzed from a lexical-syntactic perspective (cf. Hale & Keyser 1993, 1998; HK henceforth).

In order to exemplify my proposal, I will concentrate on the case study of the verb climb, whose lexical representation is analyzed by Jackendoff (1985, 1990); (J henceforth). Let us then review his analysis of this verb. Consider the examples in (1), drawn from J (1990: 76).

(1) a. Joe climbed (for hours).
   b. Joe climbed the mountain.
   c. Joe climbed down the rope.
      along the ridge.
      through the tunnel.
      etc.

In his lexical analysis, J proposes the unification device in (2) to account for the argument structure alternations in (1). According to his notation, the Path-constituent in (2) abbreviates the two possibilities in (3): (3a) corresponds to (1b), and (3b) corresponds to (1a) and (1c). In (1a), the Path is said to be unspecified.

* I am grateful to the audience of BLS 26 for comments and suggestions. Research for this paper has been supported by the MEC DGCYT: PB96-1199-CO4-02, and the Generalitat de Catalunya through projects 1998 XT 00065, 1999 SGR 00113, and CREL-9.
(2) \[
\text{climb} \\
\text{V} \\
<\text{XP}> \\
\left[\text{Event GO ([\text{Thing}_i], [\text{Path} \{ \text{TO} \{ \text{Place} \{ \text{TOP-OF} ([\text{Thing}_j]) \} \} \}])} \right]
\]

(3) a. \[\text{[Path} \text{ TO} \{ \text{Place} \{ \text{TOP-OF} ([\text{Thing}_j]) \} \} \]
   b. \[\text{[Path}_i\]

Furthermore, J refines upon the conceptual analysis of \textit{climb} in (2) in order to capture the prototypicality effects shown by this lexical element: See the examples in (4), drawn from J (1990: 35). As stressed by J, the conceptually-based lexical decomposition is not to be based on traditional feature systems nor guided by the criterion of necessary and sufficient conditions. Rather, it is to be based on a ‘preference rule system’.

(4) a. Bill climbed (up) the mountain.
   b. Bill climbed down the mountain.
   c. The snake climbed (up) the tree.
   d. ?* The snake climbed down the tree.

The preference features that J assumes to be involved in \textit{climb} (i.e. traveling \textit{UPWARD} and motion through \textit{CLAMBERING}) are both present in (4a) and (4b), which are examples of ‘stereotypical’ climbing. When only one condition is respected (e.g. (4c)), the example is judged to be sufficient for a positive judgement as well. When both conditions are violated, the instance cannot at all be characterized as climbing (e.g. (4d)).

To be sure, the conceptual analysis of (2) plus its associated prototypicality effects relate well with our intuitions about our background knowledge concerning \textit{climb}. In this paper, I do not pretend to deny the value of J’s insights on the conceptual analysis. My main concern here will be that of analyzing the status of argument structure in linguistic theory. It is precisely in this point where my approach diverges greatly from J’s. Quite importantly, with HK (1993), I claim that argument structures are not to be drawn from pure, non-linguistic conceptual structures, but from linguistically motivated lexical-syntactic structures, which in turn can be argued to be directly associated with semantic structures, perhaps in an isomorphic way (cf. Bouchard (1995), Baker (1997), and Mateu (1999) for discussion on the homomorphism between syntactic and semantic structures).

2. \textbf{Argument structure meets homomorphism}

The purpose of this section is to show that there is a strong homomorphism between the syntax and semantics of argument structure. My present proposal partakes of both HK’s (1993) paper, where certain meanings were associated with
certain syntactic structures, and their more recent (1998) paper, where a refinement of the basic argument structure types is presented. According to HK (1998), the argument structure relations a head X can enter into are those in (5): In (5a) X only takes a complement; in (5b) X takes both a complement and a specifier; in (5c) X only takes a specifier; finally, in (5d) X is a non-relational element. Moreover, it is important to note that the universal argument structure categories in (5) must not be mixed with their language-specific morphosyntactic realizations: Their morphosyntactic realization in individual languages as Vs, Ps, and so on, is a parametric issue (see HK (1998)). Due to my concentrating on the relation between the syntax and semantics of argument structure, here I will not be concerned with the morphosyntactic realizations of the LRS elements.

(5) The Structural Types of Lexical Relational Structures (HK (1998))
    a. \([_x X Y]\)    b. \([_x Z [_x X Y]]\)    c. \([_a Z [_a \alpha X]]\)    d. X

In order for my proposal concerning homomorphism to come to the fore, an important reduction or modification of (5) appears to be necessary. In Mateu & Rigau (2000), it is claimed that the lexical head X in (5c) is not a primitive element of the argument structure theory, as in HK’s approach, but a composite unit. The secondary lexical category Adjective, which semantically expresses a state, can be argued to be decomposed into two elements: a non-relational element (similar to that instantiated by N) plus a relational element (similar to that instantiated by P), the former being incorporated into the latter. That is, our claim is that the structural combination in (5b) can also be argued to account for the argument structure properties of Adjs. Accordingly, the argument structure of the small clause involved in two examples like those in (6a-6b) turns out to be the same, that in (6c). Crucially, the incorporation of Y into X in (6c) accounts for both the relational nature of Adjs, which these share with P, and their nominal properties in languages like Latin, where these are marked with morphological case.

(6) a. is [the cat [in the room]]    b. is [the cat [happy]]    c. is \([X Y [X X Y]]\)

Quite probably, HK would not be happy with such a modification or reduction, since the causative/inchoative alternation is presented by them as an important point for maintaining the distinction between the denominal verbs that involve the merge of (5b) into (5a) (see (7a)), and the deadjectival verbs that involve the merge of (5c) into (5a) (see (7b)). According to them, this explains why the former are always transitive, whereas the latter have an intransitive variant (the \(\alpha\) verbal head being then inflected with Tense).

(7) a. *([_v [v e]] [p N [p e] [N shelf]]) John shelved the books; *the books shelved
    b. ([_v [v e]] [v N [v e] [A clear]]) John thinned the sauce; the sauce thinned
However, as pointed out by Kiparsky (1997), HK’s structurally-based generalization is not fully well-grounded: Denominal verbs can participate in the causative/inchoative alternation if they denote events which can proceed without an explicit animate agent (e.g., pile (up), carbonize, oxidize, etc.) On the other hand, there are deadjectival verbs that cannot participate in such an alternation (e.g., legalize, visualize, etc.).

Given this, the relevant conclusion for our present purposes is the following: The fact that transitive denominal verbs do not enter into the causative alternation is not due to a structural reason, as HK propose, but to the fact that they usually involve an animate agent. Therefore, the main objection that HK could entertain with respect to my eliminating the apparently basic combination of (5c) vanishes into thin air. This reduction accepted, the basic, irreducible argument structure types turn out to be those in (8):

(8) The Structural Types of LRSs revisited
   a. \([x X Y]\)  b. \([x Z [x X Y]]\)  c. \(X\)

The reduction of (5) to (8) allows homomorphism to come to the fore, this being expressed in (9). Given (9), the relational syntax of argument structure can be argued to be directly associated to its corresponding relational semantics in quite a uniform way.

(9) a. The lexical head \(X\) in the syntactic configuration in (8a) is to be associated to an eventive relation.
    b. The lexical head \(X\) in the syntactic configuration in (8b) is to be associated to a spatial relation.
    c. The lexical head \(X\) in the syntactic configuration in (8c) is to be associated to a non-relational element.

In turn, the eventive relation, which is uniformly associated with the \(X\) in (8a), can be instantiated as two different semantic relations (see (9a')): If there is an external argument in the specifier position of the relevant F(unctional) projection (e.g., \(v\) in Chomsky (1995) or Voice in Kratzer (1996)), the eventive relation will be instantiated as a causal relation, the external argument being interpreted as Causer or Originator. Quite crucially, I will assume that both transitive and unergative verbs are lexically marked with a strong \([v]\) feature to be checked in the relevant Functional projection introducing the external argument. The so-called ‘assignment of theta-role to the external argument’ can then be said to be licensed through this checking process.

If there is no external argument, the eventive relation will be instantiated as a transitional relation. The transitional relation always selects a spatial relation, whose specifier and complement can be said to be interpreted as Figure and Ground respectively (this terminology being adapted and borrowed from Talmey (1985)).
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(9) a’. The lexical head $X$ in the syntactic configuration in (8a) is to be associated to an eventive relation: if there is an external argument, it is interpreted as a causal relation; otherwise, it is interpreted as a transitional relation (See Harley (1995) for a similar view).

Let me then comment on briefly some relevant aspects of the resulting argument structures in (10).

(10) a. transitive structure: $[Z_1 [F \ F [X_1 X_1 [X_2 Z_2 [X_2 X_2 Y_2]]]]]

b. unergative structure: $[Z_1 [F \ F [X_1 X_1 Y_1]]]

c. unaccusative structure: $[X_1 X_1 [x_2 Z_2 [x_2 X_2 Y_2]]]

The main structural difference between transitive structures (see (10a)) and unergative structures (see (10b)) is based on the type of complement selected by the causal relation ($X_1$): While a spatial relation ($X_2$) is selected in (10a) as complement, it is a non-relational element ($Y_1$) that is selected in (10b). Moreover, notice that the transitive structure in (10a) can be argued to partake of both an unergative structure (notice that it includes the causal relation to be associated with an external argument $Z_1$ via $F$) and an unaccusative structure (note that it includes the spatial relation $X_2$).

3. Argument structure and lexical decomposition: the case of climb revisited

With this sketchily reviewed theoretical background in mind, let us now deal with our particular case study. Quite importantly, I claim that the minimal lexical decomposition in order to draw argument structures is guided by syntax, an enterprise not to be mixed with that carried out by Generative Semanticists in illo tempore: that is, we do not pretend to syntacticize semantic intuitions or encyclopedic knowledge! Intuitions and background knowledge are put aside, and only linguistic/syntactic facts must be taken into account when working out argument structures via lexical decomposition. For example, let me exemplify it with the analysis of climb in (1a), repeated below. The three ‘unaccusative diagnostics’ in (11) (auxiliary selection in (11a), postverbal subjects without determiner in (11b), and absolute participial clauses in (11c)) should be enough to show that climb in (1a) projects an unergative structure.

(11) a. Gianni ha*è scalato. Gianni HAS*IS climbed (cf. okGianni è arrivato) Italian
    a’. dat Jan geklommen heeft.*is that Jan climbed HAS*IS (cf. okdat Jan gevallen is) Dutch

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b. *Escalan niños. (cf. \( \text{L} \)lenan niños) Spanish
climb-3rd.pl boys arrive boys
c. *Una vez escalar los invitados, ... (cf. \( \text{L} \)una vez \( \text{L} \)egados los invitados,...)
once climbed the guests,... once arrived the guests,...

As noted in section 2, I assume that unergative verbs like climb in (1a) project the LRS in (12), the argument Joe being truly external to the LRS (see (10b)). Following HK (1998), I also assume that the empty phonological matrix associated to \( X \) forces the copy of the phonological label of \( Y \) into \( X \).

(12) \[ \begin{array}{c}
X \\
\mid \\
X \\
[\text{climb}]
\end{array} Y \]

On the other hand, if we are willing to respect the homomorphism between the syntax and semantics of argument structure, it would seem more appropriate to associate (12) with an internal causal relation (say DO) plus its complement, which expresses the caused event (cf. (13a)), rather than with the semantic/conceptual functions typically associated with the vast majority of unaccusative verbs, as in J’s analysis (cf. (13b)).

(13) a. \([\text{DO DO CLIMB}]\)
    b. \([\text{Event GO ([\text{Thing}\]}, [\text{Path}\])}]\); cf. (2)-(3b)

As far as the argument structure is concerned, it is then important to note that the syntactically motivated lexical decomposition of (1a) stops at the coarse-grained level of (13a).

Moreover, note that there is no morphosyntactic evidence in (1a) nor in (1b), repeated below, which forces us to refute Talmy’s (1985) claim that physical paths do not conflate into the verb in English (Latinate words being put aside, in English abstract paths can be argued to do so in so-called ‘change of state’ verbs).

(1) a. Joe climbed.
    b. Joe climbed the mountain.

Indeed, in (1b) Joe can be said to be the entity that has moved to the top of the mountain through his climbing, as is partly reflected in J’s CS analysis in (3a):

(3) a. \([\text{Path TO ([\text{Place TOP-OF ([\text{Thing}\]})}]})\]; cf. (1b)
Syntactically-based Lexical Decomposition

However, I want to argue that the description of this fact has been ‘construed’ not in (1b), but in (14).

(14) Joe climbed to the top (of the mountain).

To put in Langacker’s (1987) insightful terms of (15), both (1b) and (14) can be argued to refer to a similar conceptual scene, but they represent two different construals of such a conceptual scene.

(15) “Meaning is a function of both conceptual content and construal”.

It is then important to note that I am not just claiming that (1b) and (14) differ with regard to syntactic structure. Due to my assuming an homomorphism between the syntax and semantics of argument structure, I am also led to conclude that (1b) and (14) differ semantically as well. As a result, their corresponding analyses are the following: (1b) is to be associated with the transitive causative LRS in (16a), this LRS being related to the semantics in (16b) in quite a uniform way.

(16) a. \([Z_1 \ [F \ [X_1 \ [X_2 \ Z_2 \ [X_2 \ X_2 \ Y_2]]]]]\)
b. \([JOE \ [CAUSED \ [THE \ MOUNTAIN \ [CLIMBED]]]]\)

On the other hand, my claim is that (14) involves the ‘conflation’ (to use Talmay’s (1985) term) of two different LRSs: The main unaccusative LRS in (17a) (that corresponding to the semantics in (17b)) is conflated with the subordinate unergative LRS of (12) by means of a ‘generalized transformation’ (see HK (1997)), this kind of transformation being now revived in the strongly derivational model adopted in Chomsky’s (1995) ‘Minimalist Program’. Since the empty phonological matrix corresponding to the transitional relation \(X_1\) is not saturated by its complement \(X_2\) (this being due to the fact that physical paths do not incorporate into the verb in English (Talmay (1985))), a complex head from an independent LRS (e.g., that in (12)) is then allowed to do so (see (18)).

(17) a.

\[
\begin{align*}
X_1 \\
X_1 & \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow 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\rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \righte...
(18) a. 

\[
\begin{align*}
X_0 & \quad \text{Y}_0 \\
X_1 & \quad Z_2 \\
X_2 & \quad \text{Y}_2
\end{align*}
\]

b. \[\text{DO CLIMB}] \text{[GO}] \text{[JOE TO TOP]}\] (‘Joe climbed to the top’)

Notice that the present generalized transformation is nothing but an instance of the Merge operation (see Mateu & Rigau (2000)), by means of which the complex head of the unergative LRS in (12) comes to be adjoined to the empty phonological head $X_1$ of the unaccusative LRS in (17a). As a result, the phonologically full head of the former provides the empty head of the latter with phonological content.

The conflation in (18a) appears to be motivated by morphophonological reasons, in particular, by a principle like ‘Avoid empty matrices at PF’ (see HK (1998)). Of course, when the transitional relation head $X_1$ has phonological content, there is no conflation involved, (19a) being the analytical variant corresponding to (14).

As shown by Mateu & Amadas (1999), morphophonological reasons can also be appealed to in order to explain Talmy’s (1985) observation that Romance languages do not have conflations of the English kind, witness (19b)-(19c). It is usually the case that the directional path is incorporated into the verb in these ‘verb-framed languages’ (Talmy (1991)), this provoking the lexical saturation of the phonological matrix associated with the verb (see (20b)). As a result, the conflation of this verb with an independent complex head expressing ‘manner’ turns out to be excluded in these languages. See Mateu & Amadas (1999) for more discussion.

(19) a. Joe went to the top climbing. 
   b. *Joe escaló a la cima (cf. (14))
   c. *La botella flotó a la cueva. (cf. (20a))

(20) a. The bottle floated into the cave
   b. La botella entró a la cueva flotando
   The bottle went+into to the cave floating

With HK, I argue that the conflations discussed by Talmy (1985) (e.g., conflation of ‘motion’ with ‘manner’ in English, and conflation of ‘motion’ with
‘path’ in Romance) do not take place at a pure semantic or conceptual level, but at a lexical-syntactic level, the latter being the locus of parameterization of morphosyntactic facts concerning argument structure. To be sure, J (1990) and Goldberg (1995) are right when saying that conflations like those involved in (14) or (20a) have semantic restrictions. This notwithstanding, with HK (1997), I posit that conflation is a syntactic process which, as shown above, can be argued to satisfy external conditions like that of avoiding phonologically empty matrices at PF.

Moreover, it is not clear to us whether semantic approaches like the ‘projectionalist’ one put forward by Levin & Rappaport Hovav (1998), or the ‘constructionalist’ one developed by Goldberg (1995), can provide a principled explanation of the parameterization issue involved in the conflation processes under study, e.g., that distinguishing English from Romance with respect to the conflation of ‘motion’ with ‘manner’. For example, let me comment on Levin & Rappaport Hovav’s (1998: 256) LCS-based analysis of the descriptive generalization, according to which English manner of motion constants can be associated with both activity and accomplishment lexical semantic templates, while Romance allows such constants to be associated only with activity lexical semantic templates. See (21):

(21)    a. Joe climbed    b. Joe climbed to the top

<table>
<thead>
<tr>
<th>Activity</th>
<th>Accomplishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>climb</td>
<td>climb</td>
</tr>
</tbody>
</table>

\[
\begin{array}{c}
\text{ACT (x)} \\
[\text{CLIMB}]_{\text{MANNER}} \\
\text{GO}_1(x, y) \\
[\text{CLIMB}]_{\text{MANNER}}
\end{array}
\]

From our present perspective (which could be wrong, to be sure), semanticocentric approaches neglect the important morphosyntactic explanation of why Romance languages prevent the so-called ‘manner of motion verbs’ like walk or climb from appearing in accomplishment structures. If my lexical-syntactic analysis is along the right lines, we have an explanation of why Romance languages do not have the ‘descriptive’ association in (21b). Furthermore, if my proposal is correct (cf. (18)), the syntax and semantics of (21b) turns out to be much more complex than that of (21a): in particular, I have posited that (21a) is somehow included into (21b): i.e., Joe climbed to the top means Joe went to the top by doing climbing. See Mateu & Amadas (1999).

Finally, I would like to conclude the present paper by commenting on the fact that the conflation depicted in (18) takes place only when the verb appears with what Aske (1989) calls ‘a telic path phrase’. Aske, in a qualification to Talmy’s
(1985) typology, pointed out that there are two types of path phrase, those in (22):

(22) a. A one-dimensional locative path phrase adds the "location" (i.e., the path
     or one-dimensional region) in which the activity took place.
     b. A telic path phrase predicates an end-of-path location/state of the Figure.

Both types are possible in English (see (23a)-(23b)), but only the former is possible in Romance (see the Spanish example in (23a')).

(23) a. Joe climbed {along / through} the tunnel
     b. Joe climbed {onto the wall / out of the tunnel}
     a'. Sp. Joe escala {por / a través de} el túnel

Aske's insight could be explained within the present lexical-syntactic approach by postulating that 'telic paths' like onto the wall occupy a complement position in the unaccusative LRS (see (17a)), whereas 'atelic paths' like along the tunnel are adjuncts to the unergative LRS (see (12)).

4. Conclusions
In this paper, I have argued that a minimal lexical-syntactic decomposition is necessary in order to work out the relevant argument structures (see H& K(1998)). My approach to lexical decomposition contrasts with both the Generative Semantics program and J's Conceptual Semantics theory. Unlike the former, I think that only a minimal lexical decomposition can be carried out by syntactic means. Unlike the latter, I think that argument structures are not to be drawn from pure conceptual structures, but from linguistically-motivated lexical-syntactic structures. For example, I have taken pains to show why we cannot assign the same thematic structure to Joe climbed the mountain and Joe climbed to the top of the mountain. Quite importantly, the homomorphic nature of the relation between the syntax and semantics of argument structure (cf. Baker (1997), Mateu (1999)) led me to conclude that both sentences differ not only syntactically but semantically as well, even though they can be argued to refer to similar conceptual scenes.
References


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Trace of F2 Peaks as a Quantitative Descriptor of Aspiration

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The University of Texas at Austin

0. Introduction
Phonation types of obstruents have been qualitatively, or phonologically, described in terms of voicing (voiced vs. voiceless), aspiration (aspirated vs. unaspirated), and laryngealization (laryngealized vs. unlaryngealized). Phonation types of obstruents have also been quantitatively described since Lisker and Abramson (1964) described phonation types of stops in terms of voice onset time (VOT). Although VOT was accepted as the single best metric for the phonation type of stops, and a huge amount of research has been conducted in terms of VOT for stops of various languages, affricates and fricatives have seldom been described in terms of VOT. Phonation types of fricatives may not have been investigated because the variation of phonation types is minor in fricatives. However, aspirated alveolar fricatives do occur in Burmese, Karen, Mazahua (Maddieson 1984). Korean has a laryngealized alveolar fricative as well as an aspirated alveolar fricative. Affricates may not have been investigated precisely because they show almost the same pattern of phonation types as stops across languages. However, it would be more desirable to investigate phonation types of all the classes of obstruents in a unified way. On the other hand, VOT does not provide any information about what happens in the phase of consonantal articulation showing different VOT values, since VOT is only a temporal descriptor of phonation types. It may be claimed that obstruents have been sufficiently classified in terms of VOT. However, the traditional qualitative method of classification in terms of voicing, aspiration, and laryngealization is useful only for taxonomic purposes. In this sense, we need to seek a method of quantitative description of phonation types in spectral domain as well as time domain.

The present study aims at a quantitative description of phonation types of fricatives in the spectral domain. Aspiration can be best described in the spectral domain, since we can see most important characteristics of aspiration in this domain. Aspiration is acoustically characterized by the absence of a voice bar, a severe reduction of energy in the lower frequencies, and a formant transition in the higher frequencies. The absence of voice bar represents the absence of vocal
fold vibration. A severe reduction of energy in the lower frequencies results from coupling of the supraglottal and subglottal cavities. A formant transition in the higher frequencies is considered to be an acoustic correlate of the frication noise generated in the glottis. This study attempts to quantitatively describe a characteristic of aspiration occurring in the formant transition, assuming that the trace of the amplitude of F2 peaks may serve as an indicator of aspiration. This study also tries to quantify spectral characteristics of phonation types by calculating the difference in amplitude of F2 peaks between different time points. These attempts are useful in that they provide a nonlinear description of phonation types, that is, both temporal and spectral description of phonation types, unlike VOT, which provides only temporal information.

1. Method
1.1 Subject
Four subjects, two for each language, were recruited for the present study. All the subjects were native speakers of each language. English subject LH is a male in his mid thirties from Washington DC and ST a male in his mid twenties from Austin, Texas. Dialectal difference was disregarded, since no significant difference was observed with respect to phonation type across dialects. Both Korean subjects, SL and HS, were males in their mid twenties from Standard Korean area. They were born to parents also speaking Standard Korean. It had been less than 1 year since they had come to the United States. None of the subjects had a history of any speech disorder at the time of recording.

1.2 Material
The tokens used in the experiment were Korean and English alveolar fricatives preceded and followed by a low vowel /a/, that is, /aʰa/ and /a⁸a/ for Korean and /aːa/ and /aːa/ for English. Korean fricatives contrast in aspiration, not in voicing, whereas English fricatives contrast in voicing, not in aspiration. The Korean tokens were real words, while the English tokens nonsense words. Tokens were produced in isolated forms. Each token was repeated 10 times, such that the total number of the recorded materials was 80: 2 languages x 2 speakers x 2 fricatives x 10 repetitions.

1.3 Recording and Measurement
Subjects were asked to read the materials. Before recording, English subjects were asked where stress would fall in VCV tokens. They agreed that stress would fall on the second syllable. The recording was conducted in Phonetics Lab in the Department of Linguistics at the University of Texas at Austin. Subjects’ voices were recorded with a Marantz Superscope tape recorder. Sound files were created on Soundscope at a sampling rate of 22,050 Hz.

Duration of the segments, F0, and amplitude of F2 peaks were measured for each token. The duration of the preceding vowel, the fricative, and the subsequent vowel were measured. Proportion of each segment as well as the duration of the
whole token was calculated. Four points were measured to obtain duration of the
tokens: the onsets and offsets of the preceding and subsequent vowels. Duration
of the preceding vowel, the fricative, and the following vowel was calculated by
subtracting each measured time values. The onset of the preceding vowel and the
offset of the following vowel were determined by locating the first and last time
points showing the first and last pitch track in F0 plot created by autocorrelation
method with a frame advance of 5 ms. As a result, a series of ordered pairs of
<time, F0> was obtained every 5 ms. The time value in the F0 plot was used to
determine the offset of the preceding vowel and the onset of the following vowel.
The offset of the preceding vowel and the onset of the following vowel were
determined by selecting the time value, among the time values obtained in the
method mentioned above, which was closest to the one showing a striking
difference in the waveform shape, referring to voice onset. In case of voiced
fricative, only the waveform shape was consulted.

F0 was measured in 4 different time points: the onsets and offsets of the
preceding and subsequent vowels. F0 values of the onset of the preceding vowel
and the offset of the subsequent vowel were measured at the time point showing
the first and last pitch track in the F0 plot. F0 values of the offset of the preceding
vowel and the onset of the subsequent vowel were measured respectively at the
time points of 10 ms before the offset of the preceding vowel and 10 ms after the
onset of the subsequent vowel in the F0 plot.

Amplitude of F2 peaks were measured in 20 ms Hamming windows on
Narrowband FFT at an interval of 5 ms. The center of the window was set to the
time point in the F0 plot. Narrowband FFT was created in Sound Scope with a
FFT point of 1024 and a filter of 45 Hz. Neither 6dB preemphasis nor Smoothing
was selected. Amplitude of F2 peaks was measured from 100 ms before the offset
of the preceding vowel to 100 ms after the onset of the following vowel. The
highest peak between 1,000 and 2,000 Hz was considered to be the F2 peak. The
range covers the range of the F2 formant transition of vowel /a/ as well as the
range mentioned in Soli (1981) who has reported that the F2 peak occurred
between 1,500 and 2,000 Hz in frication noise and formant transition.

2. Results
2.1 Duration
In this section, the temporal structure of the tokens will be provided. A one-way
ANOVA was conducted to test for significant differences across tokens and
subjects in each language. Level of significance was set to .05 in all statistical
analyses.

The mean duration of the preceding vowel (V1), the fricative, the subsequent
vowel (V2), and the whole token is given in (1) below. Proportion of the three
segments was also calculated by dividing the duration of each segment by the
duration of the whole token. The proportion of the segments is illustrated in (2)
below.
(1) Mean Duration of the Whole Token and Its Segments

<table>
<thead>
<tr>
<th></th>
<th>V1 ms</th>
<th>Fricative ms</th>
<th>V2 ms</th>
<th>Total ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korean LSS /asʰa/</td>
<td>252</td>
<td>88</td>
<td>183</td>
<td>523</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>17</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>/as*a/</td>
<td>269</td>
<td>190</td>
<td>193</td>
<td>552</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>34</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>SHJ /asʰa/</td>
<td>255</td>
<td>92</td>
<td>241</td>
<td>588</td>
</tr>
<tr>
<td></td>
<td>43</td>
<td>16</td>
<td>41</td>
<td>100</td>
</tr>
<tr>
<td>/as*a/</td>
<td>231</td>
<td>127</td>
<td>244</td>
<td>602</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>21</td>
<td>41</td>
<td>100</td>
</tr>
<tr>
<td>English LH /asa/</td>
<td>106</td>
<td>123</td>
<td>188</td>
<td>417</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>30</td>
<td>45</td>
<td>100</td>
</tr>
<tr>
<td>/aza/</td>
<td>129</td>
<td>67</td>
<td>211</td>
<td>407</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>16</td>
<td>52</td>
<td>100</td>
</tr>
<tr>
<td>ST /asa/</td>
<td>104</td>
<td>182</td>
<td>300</td>
<td>586</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>31</td>
<td>51</td>
<td>100</td>
</tr>
<tr>
<td>/aza/</td>
<td>139</td>
<td>139</td>
<td>316</td>
<td>594</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>23</td>
<td>53</td>
<td>100</td>
</tr>
</tbody>
</table>

(2) Proportion of the Segments

First, the mean duration of the whole token was compared. As can be seen in (1), /as*a/ is longer than /asʰa/ in both Korean subjects. /as*a/ is longer than /asʰa/ by about 30 ms. in LSS, while by about 15 ms in SHJ. On the other hand, SHJ showed a longer duration in both /as*a/ and /asʰa/ than LSS. A one-way ANOVA was conducted to test for a significant difference between tokens for each Korean subject. The dependent variable was the duration of the whole token and the independent variable was token. There was a significant difference between tokens in LSS (F = 8.357, p = .010) but no significant difference in SHJ (F = 2.064, p = .168). Another one-way ANOVA was conducted to test for a significant difference between subjects for each token. The dependent variable was the duration of the whole token and the independent variable was subject. There was a significant difference between subjects for both /asʰa/ (F = 71.972, p = .000) and /as*a/ (F = 17.406, p = .001). For English, /asa/ was longer than /aza/ in LH but the other way in ST. /asa/ was longer than /aza/ by about 10 ms in LH, while the reverse was true by about 8 ms in ST. On the other hand, ST showed a longer duration in both /asa/ and /aza/ than LH. A one-way ANOVA was conducted to test for a significant difference between tokens for each subject. There was no significant difference between tokens for both LH (F = .441, p = .515) and ST (F = .177, p = .679). Another one-way ANOVA was conducted to
test for a significant difference between subjects for each token. There was a significant difference between subjects for both /asa/ (F = 205.338, p = .000) and /aza/ (F = 78.333, p = .000).

Second, the proportions of the preceding vowel, the fricative, and the subsequent vowel were compared. Unlike the duration of the whole token, it may be meaningless to compare the absolute duration across tokens and subjects. As shown in (2), the proportion of the subsequent vowel shows little difference across tokens but some difference across subjects. On the other hand, the fricative shows a substantial difference across tokens for both subjects but moderate difference for /as^a/ and little for /as*a/ between subjects. Statistical analyses were conducted only for the proportion of the fricative, since our main concern lies in the proportion of the fricative. A one-way ANOVA was conducted to test for a significant difference in the proportion of the fricative for Korean. There was a significant difference in the proportion of the fricative between tokens for both LSS (F = 239.864, p = .000) and SHJ (F = 29.413, p = .000), while no significant difference between subjects for /as^a/ (F = 2.542, p = .128) but a significant difference for /as*a/ (F = 99.828, p = .000). A significant difference test was also conducted for English. There was a significant difference in the proportion of the fricative between tokens for both LH (F = 64.366, p = .000) and ST (F = 39.718, p = .000), while no significant difference between subjects for /asa/ (F = 1.063, p = .316) but a significant difference for /aza/ (F = 22.353, p = .000).

2.2 F0
In this section, the F0 at 4 different time points: the onsets and offsets of the preceding and subsequent vowels will be provided. The mean F0 at the 4 time points is given in (3) and also illustrated in (4) below.

As can be seen in (4), the mean F0 is generally higher in the onset of the subsequent vowel than in any other time point for Korean subjects. The only exception is /as*a/ in SHJ but the difference between the V1 onset (104 Hz) and the V2 onset (103 Hz) is minor. The mean F0 values of both tokens are almost the same for each subject.

(3) Mean F0 at the 4 Time Points of the Token

<table>
<thead>
<tr>
<th></th>
<th>V1 Onset</th>
<th>V1 Offset</th>
<th>V2 Onset</th>
<th>V2 Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korean LSS /as^a/</td>
<td>115</td>
<td>128</td>
<td>153</td>
<td>87</td>
</tr>
<tr>
<td>/as*a/</td>
<td>116</td>
<td>128</td>
<td>155</td>
<td>89</td>
</tr>
<tr>
<td>/as^a/</td>
<td>96</td>
<td>97</td>
<td>103</td>
<td>66</td>
</tr>
<tr>
<td>/as*a/</td>
<td>104</td>
<td>96</td>
<td>103</td>
<td>71</td>
</tr>
<tr>
<td>SHJ /as^a/</td>
<td>106</td>
<td>90</td>
<td>143</td>
<td>79</td>
</tr>
<tr>
<td>/as*a/</td>
<td>108</td>
<td>84</td>
<td>110</td>
<td>79</td>
</tr>
<tr>
<td>English LH /asa/</td>
<td>101</td>
<td>91</td>
<td>142</td>
<td>99</td>
</tr>
<tr>
<td>/aza/</td>
<td>95</td>
<td>94</td>
<td>120</td>
<td>94</td>
</tr>
</tbody>
</table>

203
(4) Illustration of the Mean F0 at the 4 Time Points of the Token

Statistical analysis was performed only for the onset of the subsequent vowel, since our main concern lies in the F0 in the onset of the subsequent vowel. A one-way ANOVA test for Korean showed that there was no significant difference between tokens for both LSS (F = 1.035, p = .322) and SHJ (F = .032, p = .859), while a significant difference between subjects for both /asʰa/ (F = 757.955, p = .000) and /as*ə/ (F = 484.365, p = .000). A one-way ANOVA test for English showed that there was a significant difference between tokens for both LH (F = 63.876, p = .000) and ST (F = 25.115, p = .000), while no significant difference between subjects for /asa/ (F = .067, p = .799) but a significant difference for /aza/ (F = 14.115, p = .001).

2.3 Trace of F2 peaks
In this section, the trace of F2 peaks will be discussed. The F2 peaks of one of the tokens for each subject in each language are illustrated in (5). The figures given in (5) show the trace of F2 peaks from 100ms before the offset of the preceding vowel to 100ms after the onset of the subsequent vowel. The vowels have higher amplitude values than the fricative. There seems to be no substantial difference between the preceding vowel and the subsequent vowel in Korean, while the following vowel has much higher amplitude than the preceding vowel in English, which seems to reflect that stress falls on the second syllable. A very low amplitude at the first time point in English subject ST's /asa/ means that the preceding vowel has the onset of the vowel around that time point.

We need to focus on the transition from the preceding vowel to the fricative and from the fricative to the subsequent vowel. We can observe an abrupt decrease at the onset of the fricative and an abrupt increase at the offset of the fricative for Korean /as*ə/, so that we can see a clear cut between the vowels and fricative. The overall shape can be compared a wide valley with cliffs on either side. On the other hand, we can observe a gradual decrease at the onset of the fricative and a gradual increase at the offset of the fricative for Korean /asʰa/, so that we cannot identify the boundary between the vowels and the fricative. The overall shape can be compared to a narrow valley with less steep slope.
Trace of F2 Peaks as a Quantitative Descriptor

(5) Trace of F2 Peaks
English /asa/ is similar to Korean /as*a/ in the overall pattern of the trace of F2 peaks, while English /aza/ to Korean /as^a/. We can also see a substantial difference in the overall amplitude of F2 peaks of the fricative between English /asa/ and /aza/, which can be compared to elevation of the bottom of the valley.

The present study attempts to quantify the amplitude of F2 peaks (L2) of the fricative, or the elevation of the valley bottom, and the increment of L2 between two time points, that is, slope. First, mean L2 of the fricative was calculated by dividing sum of the L2 values of each window in the fricative by the number of windows. The mean amplitude of F2 peaks of the fricative is given in (6) and also illustrated in (7) below.

(6) Mean Amplitude of F2 Peaks of the Fricative

<table>
<thead>
<tr>
<th></th>
<th>Korean</th>
<th></th>
<th>English</th>
<th></th>
<th>Diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LSS</td>
<td>SHJ</td>
<td>LH</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>/s^h/</td>
<td>35.7</td>
<td>32.5</td>
<td></td>
<td></td>
<td>3.2</td>
</tr>
<tr>
<td>/s*/</td>
<td>28.7</td>
<td>27.8</td>
<td></td>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td>/s/</td>
<td></td>
<td></td>
<td>39.4</td>
<td>38.8</td>
<td>0.6</td>
</tr>
<tr>
<td>/z/</td>
<td></td>
<td></td>
<td>30.8</td>
<td>37.0</td>
<td>6.2</td>
</tr>
<tr>
<td>Diff.</td>
<td>7.00</td>
<td>4.7</td>
<td>8.6</td>
<td>1.8</td>
<td></td>
</tr>
</tbody>
</table>

(7) Illustration of the Mean Amplitude of F2 Peaks of the Fricative

![Mean Amplitude of F2 Peaks](image)

As seen in (7), the mean L2 is higher in /s^h/ than in /s*/ for both Korean subjects. On the other hand, it is higher in /z/ than in /s/ for both English subjects. Statistical analyses were performed to test for significant differences between fricatives for each subject of each language. A one-way ANOVA test for Korean showed that there was a significant difference between fricatives for both LSS ($F = 72.248, p = .000$) and SHJ ($F = 78.868, p = .000$), while a significant
Trace of F2 Peaks as a Quantitative Descriptor

difference between subjects for /sʰ/ \((F = 25.205, p = .000)\) and no significant difference for /s*/ \((F = 1.575, p = .226)\). A one-way ANOVA test for English showed that there was a significant difference between fricatives for both LH \((F = 103.179, p = .000)\) and ST \((F = 4.719, p = .043)\), while no significant difference between subjects for /s/ \((F = .750, p = .398)\) but a significant difference for /z/ \((F = 44.642, p = .000)\).

Second, two kinds of mean increment of L2 were calculated: mean increment of L2 between the window at mid-time point of the fricative (Wm) and the window at the time point of 10 ms prior to the offset of the fricative (W-10), and that of L2 between W-10 and the 8th window backward from the offset of the fricative, that is, the time point 50 ms prior to the offset of the fricative (W-50). The reason for selecting W-10 is that that time point is the center of the last window containing no or least fragment of the following vowel. The reason why increment of L2 between Wm and W-10 is calculated is simply that we can see L2 transition of the latter half of the fricative comparison. On the other hand, the reason why increment of L2 between W-50 and W-10 is calculated is that we can observe most prominent L2 transition between the two time points. The mean increments of L2 between Wm and W-10 and between W-50 and W-10 were calculated by dividing the increment of L2 between the two time points by the number of the windows between the two time points, respectively. The present study quantifies only the increment in CV transition. The same method can be applied to the decrement in VC transition.

The mean increments between W-10 and Wm and between W-10 and W-50 are given in (8) and also illustrated in (9) below. First, the mean increment of L2 between Wm and W-10 was compared. For Korean, /sʰ/ shows a higher value than /s*/ for both subjects. For English, /z/ shows a higher value than /s/ for both subjects. Difference in the mean increment of L2 between fricatives is almost the same in all the subjects regardless of language. Second, the mean increment of L2 between W-50 and W-10 was compared. For Korean, /sʰ/ also shows a higher value than /s*/ for both subjects. For English, /z/ shows a higher value than /s/ for both subjects. Difference in the mean increment of L2 between W-50 and W-10 is not the same in all the subjects but the difference in one of the subjects is almost double that in the other in each language.

(8) Mean Increment of Amplitude of F2 Peaks of the Fricative

<table>
<thead>
<tr>
<th></th>
<th>Wm and W-10</th>
<th>W-50 and W-10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LSS</td>
<td>SHJ</td>
</tr>
<tr>
<td>Korean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/sʰ/</td>
<td>1.74</td>
<td>0.49</td>
</tr>
<tr>
<td>/s*/</td>
<td>0.95</td>
<td>-0.23</td>
</tr>
<tr>
<td>English</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/s/</td>
<td></td>
<td>-0.28</td>
</tr>
<tr>
<td>/z/</td>
<td></td>
<td>0.55</td>
</tr>
<tr>
<td>Diff</td>
<td>0.79</td>
<td>0.72</td>
</tr>
</tbody>
</table>

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(9) Illustration of the Mean Increment of Amplitude of F2 Peaks of the Fricative

Statistical analyses were performed to test for significant differences between fricatives for each subject of each language. First, a significant difference test was conducted for the increment of L2 between Wm and W-10. A one-way ANOVA test for Korean showed that there was a significant difference between fricatives for both LSS (F = 27.876, p = .000) and SHJ (F = 10.730, p = .004), and a significant difference between subjects for both /sʰ/ (F = 19.731, p = .000) and /s*ʃ/ (F = 12.731, p = .002). A one-way ANOVA test for English showed that there was a significant difference between fricatives for both LH (F = 12.072, p = .003) and ST (F = 9.230, p = .007), while no significant difference between subjects for both /s/ (F = .002, p = .963) and /z/ (F = 2.690, p = .118). Second, a significant difference test was conducted for the increment of L2 between W-50 and W-10. A one-way ANOVA test for Korean showed that there was a significant difference between the fricatives for both LSS (F = 10.345, p = .005) and SHJ (F = 15.350, p = .001) and a significant difference between subjects for both /sʰ/ (F = 27.795, p = .000) and /s*ʃ/ (F = 37.511, p = .000). A one-way ANOVA test for English showed that there was a significant difference between the fricatives for both LH (F = 15.937, p = .001) and ST (F = 14.042, p = .001), while no significant difference between subjects for both /s/ (F = 1.205, p = .287) and /z/ (F = .690, p = .417).

3. Discussion

We investigated temporal and spectral characteristics of the fricatives of Korean and English in VCV context. First, an examination of the duration of the whole token showed that Korean /as*ə/ was significantly longer than /asʰə/ for one of the Korean subjects and that there was no significant difference between /asa/ and /aza/. On the other hand, an examination of the proportion of the segments showed that Korean /s*ʃ/ is significantly longer than /sʰ/ and English /s/ than /z/ without a significant difference in the proportion of the subsequent vowel. The difference in the duration of the whole token between subjects is not a serious
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issue, since an absolute duration of the whole token could be quite variable. However, the significant difference in the proportion of the fricative in both languages leads us to conclude that it may be an important indicator of the difference between the homorganic fricatives in VCV context in each language.

Second, F0 was higher in the onset of the subsequent vowel than in the other points for both languages. On the other hand, an investigation of the F0 in the onset of the subsequent vowel demonstrated that there was no significant difference between /sʰ/ and /s*/ while a significant difference between /s/ and /z/. The inter-speaker difference is not an important issue, since F0 is often quite variable across speakers. In Korean, F0 in the onset of the vowel following either /sʰ/ or /s*/ was higher, which was also noted in (1993) and Ahn (1999). In English, F0 in the vowel onset after /s/ was significantly higher than after /z/, which may be an important attribute distinguishing the homorganic fricatives in English.

Third, an examination of spectral characteristics of the trace of F2 peaks demonstrated interesting results. We could observe a gradual increase of L2 in Korean /asʰa/ and an abrupt increase of L2 in Korean /as*a/ and a gradual increase of L2 in English /aza/ and an abrupt increase of L2 in English /asa/. Quantification of the trace of F2 peaks showed that Korean /sʰ/ was significantly higher than /s*/ in the mean L2 of the fricative and the mean increment and English /z/ than /s/. Difference in the mean increment between fricatives was constant for both languages. A significantly higher values of both metrics in Korean /sʰ/ is due to a higher level of L2 around the offset of the fricative. The higher L2 around the offset of the fricative is an indicator of aspiration and the fricatives were distinguished with a significant and constant difference. However, it is not sure that the same is true for English fricatives, even though trace of F2 peaks also served as an important cue to distinguish /s/ and /z/. Whether it is aspiration or some other characteristic that causes a higher value of the L2 around the offset of the fricative fricatives remains to be studied.

4. Conclusion

It has been made apparent that fricatives can be distinguished in terms of temporal and spectral cues, such as proportion of the fricative in VCV context, F0, and trace of F2 peaks. It has been claimed that trace of F2 peaks serves as an important cue to distinguish fricatives and the spectral attributes in the trace of F2 peaks around the offset of the fricative is an indicator of aspiration. It is notable that Korean /s*/ is very similar to English /s/ in all the aspects discussed in the present study. A study of a language with three series of fricatives (voiced, voiceless unaspirated, and voiceless aspirated), if any, would enable us to describe phonation types of fricatives more satisfactorily. The metrics proposed in the present work must be attested through a study of other classes of sounds, in various contexts, and in different languages with a sufficient number of subjects. Those works remain to be done.
References


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Linguistic vs. Metalinguistic Intuitions*

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University of Pennsylvania

1. Introduction.
The term 'intuition' has been used in two ways in modern theoretical linguistics, both as a synonym for competence and as a synonym for \textit{meta}-intuition, that is, introspective judgments about those other intuitions:

(1) \textbf{'Intuition' = competence} (Unconscious, inaccessible, automatic ability to process utterances of one's language):

'A distinction must be made between what the speaker of a language knows implicitly (what we may call his \textit{competence}) and what he does (his \textit{performance}). A grammar, in the traditional view, is an account of competence. It describes and attempts to account for the ability of a speaker to understand an arbitrary sentence of his language... Notice, incidentally, that a person is not generally aware of the rules that govern sentence-interpretation in the language that he knows; nor, in fact, is there any reason to suppose that the rules can be brought to consciousness. Furthermore, there is no reason to expect him to be fully aware even of the empirical consequences of these internalized rules — that is, of the way in which signals are assigned semantic interpretations by the rules of the language that he knows (and, by definition, knows perfectly). On the difficulties of becoming aware of one's own linguistic intuitions, see the discussion in Chomsky, Aspects of the theory of syntax, Ch. I, § 4.' (Chomsky 1965:9ff.)

'Obviously, every speaker of a language has mastered and internalized a generative grammar that expresses his knowledge of his language. This is not to say that he is aware of the rules of the grammar or even that he can become aware of them, or that his statements about his intuitive knowledge are necessarily accurate.' (Chomsky 1965:8)

(2) \textbf{'Intuition' = meta-intuition, introspective judgment} (Conscious, accessible meta-intuition about our linguistic intuitions):
'There is, first of all, the question of how one is to obtain information about the speaker-hearer's competence, about his knowledge of the language. Like most facts of interest and importance, this is neither presented for direct observation nor extractable from data by inductive procedures of any known sort. Clearly, the actual data of linguistic performance will provide much evidence for determining the correctness of hypotheses about underlying linguistic structure, along with introspective reports (by the native speaker, or the linguist who has learned the language).' (Chomsky 1965:18)

'The problem for the grammarian is to construct a description and, where possible, an explanation for the enormous mass of unquestionable data concerning the linguistic intuition of the native speaker (often, himself)...' (Chomsky 1965:20)

'One may ask whether the necessity for present-day linguistics to give such priority to introspective evidence and to the linguistic intuition of the native speaker excludes it from the domain of science. The answer to this essentially terminological question seems to have no bearing at all on any serious issue.' (Chomsky 1965:20)

'...In short, we must be careful not to overlook the fact that surface similarities may hide underlying distinctions of a fundamental nature, and that it may be necessary to guide and draw out the speaker's intuitions in perhaps fairly subtle ways before we can determine what is the actual character of his knowledge of his language or of anything else.' (Chomsky 1965:24)

1. Qualitative difference between 'primary' intuitions and meta-intuitions.
   This confusion/conflation is unfortunate as there are qualitative differences between the two types of intuition. What I shall call 'primary' intuitions are well known to be distributed evenly across population, they develop at the same age and in the same way in all non-pathological humans, they are part of the endowment of the species. In contrast, what I am calling 'meta-intuitions', while still poorly understood, have been shown not to be uniformly distributed across the species; for example, Gleitman and Gleitman 1970 show that the ability to report on judgments of novel compound nouns varies by age and class.

   I believe the distinction between primary intuitions and meta-intuitions is an important one, both cognitively and methodologically. In particular, I propose the following hypothesis about the nature of meta-intuitions:

   (3) **Hypothesis about (one property of) linguistic meta-intuitions:**
   Faced with a sentence in isolation, speakers are much better at imagining an appropriate social/situational context in which it might occur felicitously than at imagining an appropriate discourse context.

   **Social context:** Aspects of the discourse situation: age, class, sex, 'type' of people who would use it, type of speech event they are engaged in, affective properties (politeness, sarcasm, 'emphatic' style...), etc.
**Discourse context:** Aspects of the information structure of the proposition conveyed, various types of anaphoric relations holding between entities represented in an utterance and other entities which would be present in the discourse-model under construction, were the utterance to occur naturally in a coherent discourse, etc.

2. **Anecdotal evidence for hypothesis.**

2.1. **Do-imperative**

Schmerling 1978 reports an interesting and, I believe, very relevant observation with respect to the English do-imperative. In particular, she reports that native speakers confronted with examples of do-imperatives like those in (4) judge them to be markedly 'polite' and hence markedly 'female', in contrast to the unmarked imperatives in (5), which are associated neither with marked politeness nor with a particular sex:

(4)  
- a. Do come in!  
- b. Do make yourself at home.

(5)  
- a. Come in!  
- b. Make yourself at home.

At the same time, she shows that do-imperatives are not in fact limited to 'polite' or 'female' speech. More specifically, she shows that do-imperatives have two distinct discourse functions, one being the 'polite'/female' one and the other being what she calls the 'Reprise' function. The latter is exemplified in (6), (6a) being an approximation of a telephone conversation she overheard her (quite masculine) husband having with a business associate and (6b) being a naturally-occurring one in my corpus:

(6)  
- a. ...I'm sending over some papers for you to look at. They show some interesting trends that no one's predicted, so far as I know. [Discussion re trends.] Ok, gotta run. Take care. And do have a look at those papers. (Based on Schmerling 1978)  
- b. I think one thing is that you should start acting like part of the family. I know, it's always hard when we move in with our children after we've been alone for a long time. [Discussion of problems encountered by third party in similar situation.] Anyway, try to think positively. And do make yourself at home there — it is your home, after all.' (Email msg, collected by BS)

*Do*-imperatives used with a Reprise function reiterate a request or order or suggestion made earlier in the discourse. Thus, (6a) repeats the request that the hearer look at some set of papers; (6b) repeats the request/suggestion that the hearer make herself at home, i.e. act like one of the family, in her children's house. Neither sounds particularly 'polite' or 'female'.

In contrast, the 'polite'/female' *do*-imperative may be uttered out of the blue, with no prior discourse context required. For example, (4a) above may be the first utterance of someone answering the doorbell, just as (5b) might.
In actual frequency, it is hard to guess which of these two functions is more common in American English; if pressed, I'd probably bet on the Reprise function being more frequent. However, it is the Politeness function that people think of when hearing a do-imperative out of context, as Schmerling notes. I believe there is a reason for this, which follows from the Hypothesis given above: Politeness and femaleness pertain to the situational context and are therefore available to the informant's meta-intuitions when s/he is judging a do-imperative isolation; reiterating a prior speech act pertains to the discourse context and is thus far less accessible.

2.2. Yiddish Subject-Prodroot
A rather different case linguistically but very similar with respect to meta-intuitions is that of Yiddish Subject-Prodroot. According to many traditional Yiddish grammarians (Kagarov 1929, Zaretsky 1929, Katz 1987, Zucker 1994, among others), the subject of a Yiddish sentence may be deleted just in case its overt form is du, the second-person singular familiar personal pronoun, as in (7):

(7) a. [0] Host dokh gezon, vi er hot geshvign di gantse tsayt. (RP.I.65)
   [0] have indeed seen how he has kept-quiet the whole time
   'You've indeed seen how he didn't speak the whole time.'
   b. Nem dir a shhtikl broyt mit puter. [0] Bist dokh avade hungerik.
      (RP.I.66)
      take-imp you-dat a piece-dim bread with butter. [0] are indeed of-course hungry
      'Take yourself a piece of bread and butter. You must be hungry.'
   c. [0] Zogst a lgn! (RP.I.69)
      [0] say-2sg a lie
      'You're telling a lie!'

These grammarians' 'meta-intuition' about the distribution of Subject-Prodroot (which is in fact mirrored by naive Yiddish speakers) is in fact wrong: Subject-Prodroot in Yiddish is in no way restricted to the second person singular, as shown in (8):

(8) i = Stere, i' = Stere's hands, j = Hersh-Ber, k = Tsine, k' = Tsine's hands
   (a) ...Az ziš vet zayn daynig vayb, (b) vet ziš dirj krikhn unter di negl. (c)
   [0i] Iz efsher nokh a mol azoy shtark vi ikh_k. (d) [0i] Host gezon ire_i
   hentip? (e) [0i'] Zaynen efsher nokh a mol azoy grob vi mayne_k.
   (GF.II.88)
   (a) '...If shei's your wife,' (b) 'shei'll drive youi crazy.' (c) '[0i] Is perhaps twice as strong as I_k.' (d) '[0i] Have seen heri handsi?' (e) '[0i'] Are perhaps twice as thick as mine_k.'

In the passage in (8), from a very popular 1923 play and subsequent movie, Grine Felder by Perets Hirshbeyn, we find Subject-Prodroot having applied to a third-person singular subject (c) and a third-person plural subject (e), as well as to a second-person singular subject (d). Similarly, first-person as well as second person plural subjects can be deleted, as shown in (9):

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(9) a. 0 \[= \textbf{Ikh}\] Bin opgeven a khoydesk, efsher shoyn mer vi a khoydesk tsayt—genug. (GF.II.83)
\[0 \[= \textbf{I}\]\] Have been [here] a month, maybe already more than a month’s time—enough.

b. 0 \[= \textbf{Ir}\] Badarft bentshn goyml. (GF.III.92)
\[0 \[= \textbf{You}\]\] Should say a prayer of thanks.

So the belief on the part of these grammarians that Subject-Prodprotect is restricted to second-person singular appears curious indeed, and one must wonder at this point how the grammarians could be so mistaken. The answer, I believe, lies in the nature of Yiddish Subject-Prodrops and how it interacts with our metalinguistic capabilities.

Elsewhere (Prince 1994), following a corpus-based Centering analysis of Yiddish Subject-Prodrops, I have argued that there are in fact two separate Yiddish 'Subject-Prodrops' from a pragmatic perspective, though syntactically they appear to be a single form. The two functions are outlined in (10):

(10) **Cb-Drop:** Main-clause-initial unstressed pronominal subjects may be deleted just in case they represent the Backward-looking Center (Cb) following a Continue transition.

**Du-Drop:** Main-clause-initial unstressed *du* 'you-sg' may be deleted.

First, note that all personal pronouns are deletable in principle. Second, with a few small exceptions, Subject-Prodrop is confined to main-clause-initial position. Third, and not surprisingly, stressed pronouns are not deletable. Fourth, and most relevant to the present discussion, the second-person singular pronoun appears to have no discourse constraints whatsoever on its deletion — if the syntactic and prosodic constraints are met, the pronoun *du* may be deleted. That is, the only constraint on this type of Subject-Prodrop is that the referent of the deleted pronoun must represent the addressee and that addressee must be a single individual with whom the speaker is on familiar terms.

Put differently, the only constraint on such Subject-Prodrops, beyond the syntactic and prosodic constraints, is a *situational* one — the pronoun must refer to a particular participant in the speech situation and that participant must be in a particular social relation to the speaker.

In contrast, if any pronoun other than *du* is to undergo Subject-Prodrop felicitously, a very special relationship must hold between the referent of that pronoun and the prior discourse context. To get a clear understanding of what this relationship is, we must look briefly at Centering theory.

(11) **Centenring Theory:**
Centering Theory is a way of modeling attentional state in discourse, a component of a theory of local discourse coherence (Grosz, Joshi, and Weinstein 1995, Walker, Joshi, and Prince 1998, among others). Within Centering Theory, each utterance $U_i$ in a coherent local sequence of utterances (a discourse segment) $U_1...U_m$ affects the structure of the discourse model as follows:

1. Each utterance evokes, explicitly and implicitly, a set of discourse entities ('filecards', following Heim 1983) called **Forward-looking centers**, or \{Cf\}.  

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2. This set is ranked according to various formal (e.g. syntactic, morphological, theta role, prosodic) features, the rankings being determined language-specifically.

3. The highest-ranked Cf in the \{Cf\} of some utterance \(U_i\) is called the **Preferred Center**, or \(Cp\), of \(U_i\).

4. The highest-ranked Cf in the \{Cf\} of utterance \(U_{i-1}\) that appears as well in the \{Cf\} of the subsequent utterance \(U_i\) is the **Backward-looking Center**, or \(Cb\), of \(U_i\). Note that, if there is no \(U_{i-1}\), as in the case with a discourse-initial \(U_i\), or, if there is a \(U_{i-1}\) but no Cf in \(U_{i-1}\) occurs in \(U_i\), then \(U_i\) lacks a \(Cb\).

\[(12) \quad \text{Centering Transitions:} \]

\[
\begin{align*}
\text{Cb}(U_i) &= \text{Cb}(U_i), \quad \text{Cb}(U_i) \neq \text{Cb}(U_{i-1}) \\
\text{Cb}(U_i) &= \text{Cp}(U_i): \quad \text{Continue} \quad \text{Smooth-shift} \\
\text{Cb}(U_i) \neq \text{Cp}(U_i): \quad \text{Retain} \quad \text{Rough-shift}
\end{align*}
\]

\[(13) \quad \text{(Original) Pronoun Rule:} \quad \text{If any Cf in an utterance is represented by a pronoun, then the Cb must be represented by a pronoun.}\]

\[(14) \quad \text{Zero Pronoun Rule (based on Japanese and Turkish):} \quad \text{If any Cf in an utterance is represented by a zero pronoun, then the Cb must be represented by a zero pronoun.}\]

\[(15) \quad \text{Revised Zero Pronoun Rule (based on Japanese, Turkish, and Yiddish):} \quad \text{If any Cf in an utterance is represented by a zero pronoun and if, in Yiddish, the Cf so represented is not 2sg, then the Cb must be represented by a zero pronoun.}\]

The notion of 'Cb following a Continue transition' is, I believe, a precise way of denoting what has often been called in the literature an 'ongoing topic' — the referent of a Cb following a Continue transition is the highest ranked entity in its clause (i.e. Cp), is the highest ranked entity in the preceding clause that occurs in this clause (i.e. Cb), and was the highest ranked thing in the clause before that that occurred in the preceding clause.

Returning to the traditional grammarians' claims about the nature of Yiddish Subject-Prodrop, we see that, although there are in fact two different types of Subject-Prodrop in Yiddish, only one of these comes to mind when speakers — even speakers who are trained grammarians — rely on their meta-intuitions by inventing examples and then conjuring up appropriate contexts. The context they conjure up is the situational context required for Du-Drop; the discourse context required for Cb-Drop is apparently inaccessible to them, with the result that they believe only the pronoun *du* is deletable.

**2.3. Left-Dislocation.**

Keenan 1977 claims that Left-Dislocations in English are characteristic of unplanned speech, not quite 'syntactically coherent', something that linguists of a different school might in fact label a 'performance error':

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(16) "[Left-Dislocations] ... stand somewhere between single subject-predicate constructions and discourse. They share properties of both. ... [T]hey ... rarely appear in highly planned discourse. We rarely find left-dislocations in written prose, for example. On the other hand, we do find left-dislocations or rather constructions like left-dislocations abundantly in the speech of young children producing multi-word utterances. ... These constructions may as well be transitional structures, anticipating more syntactically coherent sentences." (Keenan 1977:21)

And she gives as an example the token in (17):

(17) (K has been talking about the fact that his car radio was taken from his car) K: They cleaned me out. And my father oh he's // he's fit to be tied. [= Keenan 1977, ex. 10]

Interestingly, to my knowledge no one ever disputed this assessment and in fact it was consistent with my own feelings. And we find other examples, e.g. (18):

(18) 'My sisterJ got stabbed. SheJ died. Two of my sisters were living together on 18th Street. They had gone to bed, and this man, their girlfriend's husband, came in. He started fussing with my sisterJ and sheJ started to scream. The landladyJ, sheJ went up, and he laid herJ out. So sisterJ went to get a wash cloth to put on herJ, he stabbed herJ in the back. But sheJ saw her death. SheJ went and told my mother when my brother was buried. "Mother," sheJ said, "your trouble is not over yet. You're going to have another death in the family. And it's going to be meJ." And sure enough, it was. 'Welcomat, 12/2/81, p. 15

However, unfortunately for Keenan's claim and all those who believe it, Left-Dislocations do indeed occur in highly planned, even written, discourse, as illustrated in (19):

(19) a. 'Most children flourish. Most children live and grow up. Even the children in the hospital, most get well and go home and live happily ever after. Pediatrics is a comparatively happy field, a field full of happy endings.' (From P. Klass, Other women's children, 1991, cited in Phila. Inquirer Magazine, 5/24/92, p. 28)

b. 'Contrary to popular wisdom that says most white wines (except sweet dessert wines) and Champagnes do not age well, white Burgundies and premium California chardonnays gain intensity and richness after a few years of bottle age. And Champagnes, well, they acquire a rich, toasty aroma and nutty flavor that I (and the English) prefer to the crisp, acidic fruit of a young sparkler.' (Phila. Inq., 4/19/92, p. 1-2.)
c. There are many groups of cacti worthy of collection. Even opuntias, the plants which tend to give cacti a bad name, with their nasty little barbed hairs or glochids, which are used for 'itching powder', and sharp, barbed spines which go into one's flesh much more easily than they come out, even they have much to offer and can make an interesting--if forbidding--collection. Echinocereus is another group with marvellous, often highly colorful spination...' (Glass and Foster 1976:31.)

In fact, I believe the problem is that there are, as I have argued elsewhere (Prince 1997), (at least) two different functions for English Left-Dislocation, outlined in (20) and (21):

(20) **Discourse Processing Function of Left-Dislocation: 'Simplifying' LDs**
A 'Simplifying' Left-Dislocation serves to simplify the discourse processing of Discourse-new entities by removing the NPs evoking them from a syntactic position disfavored for NPs evoking Discourse-new entities and creating a separate processing unit for them. Once that unit is processed and they have become Discourse-old, they (or, rather, the pronouns which represent them) may comfortably occur in their canonical positions within the clause.

(21) **Set-inference Triggering Function of Left-Dislocation: 'Poset' LDs**
A 'Poset' Left-Dislocation serves to trigger an inference on the part of the hearer that the entity represented by the initial NP stands in a salient partially-ordered set relation to some entity or entities already evoked in the discourse-model.

If we look again at Keenan's example in (17) or the example in (18), we see that the entity represented by the leftmost NP is not in any special anaphoric relation to anything evoked in the prior discourse; in fact, both represent Discourse-New entities (Unused or Inferrable). In contrast, if we consider the Left-Dislocations in (19), we see that the leftmost NP represents a discourse entity that stands in a salient partially-ordered set relation to entities already evoked in the discourse: in (19a), *the children in the hospital* are a subset of *children*, of which another (not disjoint) subset has already been evoked by *most children* in the previous sentence; in (19b), the left-dislocated *champagnes* represents a member of the already evoked set represented by most *white wines...and Champagnes*; finally, in (19c), the left-dislocated *opuntias* represents a member of the set already evoked by *many groups of cacti*.

In terms of frequency, I again have no figures but I am here very confident that Poset LDs are far more common than Simplifying LDs; the Poset LDs outnumber the Simplifying LDs in my corpus (of mostly unplanned discourse, by the way) by more than five to one. However, when faced with a Left-Dislocation out of context, it is the Simplifying function that seems to come to mind, for Elinor Keenan and I believe for English speakers in general. Again, this would follow from the hypothesis in (3): Given a line out of context, we are very good at imagining what sort of social or situational context it might occur in but are inept at imagining what special discourse context it might be appropriate in. Simplifying LDs need no special prior discourse context and so it is them that we think of when we hear the form in isolation; we are then quick to imagine the social/situational context of
Simplifying LDs: spontaneous speech, especially of less than fully articulate speakers, e.g. small children. In contrast, Poset LDs require a very special prior discourse context — one that will allow the sort of poset inferences they mark; since we are bad at conjuring up such a constrained prior discourse context, we simply do not think of a Poset LD when hearing the form in isolation.

2.4. 'Goy-Movement' vs. Yiddish-Movement.
Many English speakers, including many English-speaking linguists, claim that they do not use OSV word-order or, if they do, only in a very restricted way, and many linguists and non-linguists alike believe that OSV word-order is the mark of English speakers of a Yiddish background. For example, in an informal presentation at the University of California at Berkeley in 1975, Jerry Morgan claimed that standard speakers can felicitously use OSV order just in case the sentence is negative or the fronted object is a demonstrative, which he jocularly labeled 'Goy-Movement', goy being the Yiddish word for 'non-Jew', as opposed to 'Yiddish-Movement', restricted to English speakers of a Yiddish background, where fronting of objects was unconstrained:

(22) Following Morgan 1975:
'Goy'-Movement: John I don't know.
                That I like.
Yiddish-Movement: [all other OSV]

As an English-speaker of Yiddish background, I personally had no reason to doubt the accuracy of this claim. However, when I read the White House transcripts shortly thereafter, I was stunned to find many instances of OSV word-order where the sentences were affirmative and the fronted objects non-demonstrative, stunned since none of the speakers were conceivably from a Yiddish background:

(23) a. Nixon: 'What I can't understand is how Mitchell would ever approve.'
    Haldeman: 'That's the thing I can't understand here.'
    Nixon: 'Well, Magruder I can understand doing things. He is not a very bright fellow. I mean he is bright, but not—
          he doesn't think through to the end. But Mitchell knows
          enough not to do something like that.' (The Presidential
          Transcripts, p. 189)

b. Petersen: 'Wasn't that story that Bittman talked to O'Brien—'
    Nixon: 'No. Bittman to O'Brien said, "Look, we need the
           money."
    Petersen: 'That's right.'
    Nixon: 'Or was it Bittman to Dean? I don't know. What kind of
           guy is O'Brien?'
    Petersen: I've only met O'Brien one time and then only recently at a
              recent Bar dinner. I don't know him. Bittman I know
              well. I just thank God I broke off social relations with
              him from the time he represented Hunt.' (The
              Presidential Transcripts, p. 678)
c. Dean: 'No one knows what in the world Sirica is doing. It is getting to be a long time now. It frankly is, and no one really has a good estimation of how he will sentence. There is some feeling that he will sentence Liddy the heaviest. Liddy is already in jail, he's in Danbury. He wants to start serving so he can get good time going. **Hunt he will probably be very fair with.**' (The Presidential Transcripts, p. 82)

In fact, subsequent research on naturally-occurring OSV word-order in English revealed that this single order, combined with different prosodic patterns, had different discourse functions (Prince 1981, Ward 1988, and elsewhere), outlined below:

(24) **Topicalization:** (Standard English)

Examples: [See 23a-c]

Function:

1. Topicalization triggers an inference on the part of the hearer that the entity represented by the initial NP stands in a salient partially-ordered set relation to some entity or entities already evoked in the discourse-model.

2. Topicalization triggers an inference on the part of the hearer that the proposition is to be structured into a focus and a focus-frame as follows. First, if the entity evoked by the leftmost NP represents an element of some salient set, make that set-relation explicit. Then, in all cases, the open proposition resulting from the replacement of the tonically stressed constituent (in the clause!) with a variable is taken to represent information saliently and appropriately on the hearer's mind at that point in the discourse, the tonically stressed constituent representing the instantiation of the variable and the new information in the discourse.

(25) **Focus-Movement:** (Standard English)

Examples:

a. 'Colonel Kadafy, you said you were planning on sending planes—**M-16s; I believe they were e₁**—to Sudan...' (ABC's World News Tonight; collected by G. Ward)

b. 'Let's assume there's a device which can do it—**a parser; let's call it e₁, What follows?**' (J.D. Fodor)

c. 'She was here two years. [checking transcript] **Five semesters; she was here e₁**.' (K.Miselis)

Function:

a. A Focus-Movement structures the proposition it represents into a focus and a focus-frame, where the focus-frame is an open proposition and the focus identifies the instantiation of its variable.

b. The open proposition conveys that a certain entity has a certain attribute, and the focus is understood as representing the particular value of that attribute, not yet known to the hearer.
c. That the entity in question has the attribute in question is marked as being assumed to be already known to the hearer and already salient in his/her consciousness at that point in the discourse.

(26) **Yiddish-Movement:** ('Yinglish')

Examples:

a. "You've got clean underwear?" "I'm washing it at night. I'm okay, Aunt Gladys." "By hand you can't get it clean." "It's clean enough. Look, Aunt Gladys, I'm having a wonderful time." "**Shmutzi** he lives in e₁ and I shouldn't worry!" (Roth 1963:54)¹

b. "Look who's here," his wife shouted at him the moment he entered the door, the day's dirt still under his fingernails. "Sol's boy." The soldier popped up from his chair and extended his hand. "How do you do, Uncle Louis?" "Gregory Peck," Epstein's wife said, "**a Montgomery Clift; your brother has e₁.** He's been here only 3 hours, already he has a date." (Roth 1963:148)

c. EP: 'What did she see in him?'

FC: 'Eleven million! **Eleven million**₁ he made e₁ on the Scarsdale Diet!'

(Conversation about the murder of the Scarsdale Diet doctor)

Function:

a. A Yiddish-Movement structures the proposition it represents into a focus and a focus-frame, where the focus-frame is an open proposition and the focus identifies the instantiation of the variable.

b. The information in the open proposition is marked as being assumed to be already known or at least plausibly inerrable to the hearer.

Note that, while all three structure the proposition into a focus and focus-frame (Vallduvi 1992, Partee 1991, and elsewhere), they each do something else in addition. What Standard English Topicalization and Focus-Movement do involves marking very constrained relationships between what the leftmost constituent conveys and what is already in the discourse model — a poset relationship in the case of Topicalization and an attribute relationship in the case of Focus-Movement. These are just the sort of things that, following the hypothesis of this paper, would be predicted to be inaccessible to our meta-intuitions when faced with an OSV sentence out of the blue.

Note further than Yiddish-Movement, which is dialectally restricted to English speakers from a Yiddish background, marks no such relationship of any kind on what the leftmost constituent conveys and what is already in the discourse model. Therefore, it follows from the hypothesis that this is the OSV type that would be accessible to a speaker when presented with this word-order out of the blue. At the same time, the social constraint on it, that it occurs in the speech of speakers of a certain nonstandard dialect, would be predicted to be the sort of thing that is accessible to meta-intuitions.

Thus, when faced with an OSV sentence out of the blue, speakers respond that it does not occur in Standard English and occurs only in the speech of 'Yinglish' speakers. Why Morgan noticed true Topicalization just in case the fronted NP was a demonstrative or the sentence is negative is less obvious. Interestingly, both
demonstratives and negative sentences typically involve poset relations —
demonstratives point to members of (perhaps singleton) sets and a negative sentence
involving some entity often occurs in the context where the corresponding
affirmative with respect to an analogous entity is salient. Perhaps these two are
simply very frequent in Topicalizations and their high frequency makes them more
salient to at least one trained linguist's meta-intuitions.

3. Conclusion.
In conclusion, I have tried to give some evidence for the importance of
distinguishing 'primary' intuitions — our unconscious linguistic competence that
permits us to produce and understand the sentences of our language — from meta-
intuitions — our conscious reflections about and opinions of those primary
intuitions. The first type are the object of study of theoretical linguists, that which we
are trying to understand and explicate. The second, while perhaps an interesting
object of study in their own right, come into play at the level of methodology and
ignoring their limitations and the substantive differences between them and 'primary'
intuitions can have very undesirable effects on our research.

*An earlier version of this paper was presented at the Corpora in Semantic and
Pragmatic Research, Institut Universitari de Lingüística Aplicada (IULA),
Universitat Pompeu Fabra, Barcelona. I am grateful to Enric Vallduví and Josep
Fontana for their helpful comments.

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1. Introduction
Kay’s (1990) study of the scalar particle even is groundbreaking for its analysis of the particle’s sensitivity to features of the discourse context:

(1) A: Can John jump 6 feet?
    B: Yes, he can even jump 7 feet.

In (1), even “marks the proposition expressed by the clause or fragment in which it occurs as MORE INFORMATIVE than some other [contextual] proposition” in the same scalar model (Kay 1990:69; emphasis added). The more informative, even-marked, “text proposition” (tp) pragmatically entails the less informative “context proposition” (cp) within a scalar model like the one schematized in (2) below. Kay’s analysis therefore relativizes the vague Gricean notion of “informativeness” to scalar models.

(2)
- "John can jump 7 feet" (tp)
- "John can jump 6 feet" (cp)
- "John can jump 5 feet" (cp)

An important consequence of Kay’s analysis is that even cannot be linked invariably to “end-of-scale” propositions (contra prior analyses, e.g. Fauconnier 1975). However, despite Kay’s analysis, the view that even invariably marks a scalar endpoint continues to be widespread, and is assumed even by scholars who explicitly accept Kay’s analysis, as the following quotes illustrate:

[W]hat all of the accounts [of even] share is the claim that even introduces a scale of unlikelihood, or negative expectation, the highest position on which is occupied by the referent of the expression in the scope of even. (Dancygier 1998:161-2)

Even is associated with the lowest member of the scale for which the proposition is asserted. (Lee and Horn 1995:15)

(13) a. Even Peewee lifted the rock.
What even ... contribute[s] to the context are presuppositions that S [=speaker] treats as noncontroversial: ... that others (in the context set) lifted the rock and that Peewee was the least likely member of this set to have done so ... (Horn 1996:306)
Exactly why these analyses have persisted in associating *even* with scalar endpoints is a question that we are not able to answer fully. However, the following proposed explanation is probably on the right track:

Probably folks continue to refer to *EVEN* as end-of-scale all these years after Kay 1990 because it’s easier and for most purposes the distinction [between end-of-scale and non-end-of-scale] doesn’t matter. (Larry Horn, email message, 1/22/00)

In the rest of this paper, we demonstrate that this distinction does matter for a comprehensive semantic/pragmatic account of pairs of scalar particles in Spanish and Hindi. These languages provide clear evidence for distinguishing between what Schwenter (1999, 2000) has termed “absolute” (endpoint-marking) and “relative” (non-endpoint-marking) particles.

2. “Even” in Spanish and Hindi

Our analysis concentrates on two pairs of scalar additive particles in Spanish (*inclusolhasta*) (Schwenter 1999, 2000) and Hindi affixes (*-bhīi/-tak*) (Vasisht 1998). These particles are in some respects “interchangeable” in their respective languages, and all can be considered translation equivalents of English *even*.

(3) **Incluso/Hasta** Pablo vino a clase.
   ‘Even Pablo came to class.’

(4) **Riinaa-bhīi/-tak** klaas-mē aayii.
    Reena-BHIII/-TAK class-in came
    ‘Even Reena came to class.’

The specific dialects we are analyzing here are Peninsular (European) dialects of Spanish (consultants from Alicante, Madrid, Valencia, Zaragoza). Our data for Hindi come from the Delhi variety of Northern Hindi.

The meaning of the particles are similar in two respects. First, both pairs of particles are SCALAR: they can be understood as situating Pablo in (3) and Reena in (4) at an “extreme” point on a scale that ranks students according to their (un)likelihood of coming to class, similarly to *even* in (1) above. Second, both particles in each language are ADDITIVE: they entail that other students more likely (or less unlikely) to come to class than Pablo/Reena also came to class today. This component of meaning is further evidenced by (5) and (6), where the additive interpretation cannot be cancelled felicitously (# = pragmatic infelicity):

(5) **Incluso/Hasta** Sara vino hoy a clase, #pero no vino nadie más.
    ‘Even Sara came to class today, but nobody else did.’

(6) **Siimaa-bhīi/-tak** aaj klaas-mē aayii, #lekin aur-koi nahiī aayaa.
    Seema-BHIII/-TAK today class-in came but other not came
    ‘Even Seema came to class today, but nobody else did.’

Without the presence of the particle(s), any implicature that other students besides Sara/Seema also came to class can be cancelled felicitously, as shown by (7) and (8). This is evidence that the particles themselves contribute the additive meaning to the sentence.

(7) Sara vino hoy a clase, pero no vino nadie más.
    ‘Sara came to class today, but nobody else did.’
Absolute and Relative Scalar Particles

(8) Siimaa aaj klaas-mē aayii thii, lekin aur-koı nahīı aayaa.
Seema today class-in came was but other not came
‘Seema came to class today, but nobody else did.’

Despite the parallelism between the particles in the preceding examples, it is noteworthy that native speakers assess the versions with hasta/-tak to be “stronger” or “more emphatic” than the versions with incluso/-bhii. To our knowledge, no previous explanation of this intuition has been offered. In the next two sections we provide a precise account of where the semantic/pragmatic differences between the two particles in each language are to be found; the analysis explicates the intuition that hasta/-tak are “stronger” than incluso/-bhii.

3. Contextual Dependence
There are clear differences between hasta/-tak and incluso/-bhii with respect to their degree of dependence on the information structure of the prior discourse context. Specifically, incluso/-bhii require that the proposition they mark be more informative than another proposition on the same pragmatic scale which is already accessible in the context (as does even). In contrast, hasta/-tak do not exhibit this requirement. Compare first the differences found in responses to WH-questions, where hasta/-tak are fully felicitous, but incluso/-bhii are odd:

(9) A: ¿Quién ha comido oreja de cerdo?
‘Who ate pig’s ear?’
B: Hasta/Incluso mi abuela la ha comido.
‘HASTA my grandma ate it.’

(10) A: kis-ne bakri-kii aankhe khaayii?
‘Who goat’s eyes ate’
B: Meri daađii-tak-ne/#-ne-bhii khaayii.
‘My grandma-TAK-erg ate’

Crucially, however, once a (less informative) scalar proposition is made accessible (i.e. at least “inferrable” in Prince’s [1992] terms) in the discourse context, incluso/-bhii become felicitous in the response (note that hasta/-tak would also be felicitous in [11] and [12], as would even in English):

(11) A: ¿Quién ha comido oreja de cerdo?
‘Who ate pig’s ear?’
B: Pues yo (la he comido) e incluso mi abuela (la ha comido).
‘Well I (ate it) and INCLUSO my grandma (ate it).’

(12) A: kis-ne bakri-kii aankhe khaayii?
‘Who goat’s eyes ate’
B: mai-ne khaayii aur meri daađii-ne-bhii khaayii.
‘I ate and my grandma-erg-BHII ate’
Further evidence for the accessible context proposition (cp) requirement comes from yes/no question contexts. As (13) shows, both particles are felicitous in the response to this kind of question:

(13)  
A:  ¿Has comido oreja de cerdo?  
   ‘Did you (sg.) eat pig’s ear?’
B:  (Sí.) Hasta/Incluso mi abuela la ha comido.  
   ‘(Yes.) HASTA/INCLUSO my grandma ate it.’

In (13), a cp of the form ‘B ha comido oreja de cerdo’ (‘B ate pig’s ear’) is accessible from the content of the yes/no question, thereby permitting the incluso-prefaced response. The same result is found for –bhii in Hindi, as shown by (14):

(14)  
A:  kya tum-ne bakri-kii aankhe khaayii?
   Q you-erg goat’s eyes ate
   ‘Did you (sg.) eat goat’s eyes?’
B:  (Haa.) Meri daadii-tak-ne/-ne-bhii khaayii.
   (Yes) My grandma-TAK-erg/-erg-BHII ate
   ‘(Yes.) My grandma-BHII/-TAK ate it.’

In sum, the examples presented above show that incluso/-bhii but not hasta/tak REQUIRE that a proposition on the same pragmatic scale be accessible in the prior discourse context, or infelicity will result. Another (naturally-occurring) example corroborates this requirement:

(15)  
[Mother watching her son playing with a new toy. NOTHING ELSE has been said about the toy]
   Ese juguete es hasta (#incluso) peligroso.
   ‘That toy is HASTA dangerous.’
   [A.C.A., 7/31/98]

In (15) the mother’s hasta-marked utterance situates the toy in question on a scale of attributes. The attribute peligroso ‘dangerous’ is presented as maximally distant from the scalar “norm” for toy attributes. The alternate version with incluso is infelicitous because no other mention of toy attributes has been made in the discourse context. Once such mention has been made, an incluso-marked utterance becomes felicitous (16):

(16)  
A:  Ese juguete es feo.
   ‘That toy is ugly.’
B:  E incluso peligroso.
   ‘And INCLUSO dangerous.’

Identical restrictions hold for an “out of the blue” utterance in Hindi (17); however, like incluso in (16), –bhii can recover its felicity given the appropriate prior discourse context, as (18) illustrates:

(17)  
[Same context as in (15)]
   Ye khilona-to bacce-kii jaan-tak/#-bhii le saktaa hai.
   this toy-top child’s life-TAK can is
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'This toy can kill-TAK a child.'

(18) A: Ye khilonaa-to bahut badsuurat hai.
     this-toy Top very ugly is
     'This toy is really ugly.'
B: Ye-to bacce-kii jaan-bhii le saktaa hai.
     this-top child's life-BHII take can is
     'And it can kill-BHII a child.'

4. Scalar "Strength"

The particles' differing degrees of dependence on context, illustrated in the previous section, is linked to the differing degrees of scalar "strength" they express, and specifically to whether or not the particle invariably marks scalar endpoints. To illustrate this more clearly, assume the pragmatic scale in (19). On this scale, propositions satisfying the schema "α came to the party" are ordered with respect to the unlikelihood that α actually came to the party (i.e. propositions higher on the scale are less likely to be true):

(19)

"Z came to the party"
"Y came to the party"
"X came to the party"

The felicity of B's responses in (20) and (21) demonstrate that incluso/-bhii do not signal a fixed point—and therefore do not signal an endpoint—on a pragmatic scale. Indeed, each particle is compatible with BOTH non-endpoint and endpoint interpretations.

(20) A: ¿Vino X a tu fiesta?
     'Did X come to your party?'
B: No sólo X, incluso vino Y e incluso Z.
     'Not only X, INCLUSO Y came and INCLUSO Z came.'

(21) A: kyaa X tumharii paartji-më aayii?
     Q X your party-in came
     'Did X come to your party?'
B: X-bhii nahii, Y-bhii aur Z-bhii aayii.
     X-only not, Y-BHII and Z-BHII came
     'Not only X, but Y-BHII and Z-BHII came.'

In (20) and (21), speaker B can use incluso/-bhii to "climb the scale" of persons ranked by their unlikelihood of attending the party. There is no contradiction in repeating incluso/-bhii (or even, as Kay [1990] has argued).

In stark contrast to incluso/-bhii, the particles hasta/-tak are infelicitous when repeated, since they result in a contradiction between the two focused elements:

(22) A: ¿Vino X a tu fiesta?
     'Did X come to your party?'
B: #No sólo X, hasta vino Y y hasta Z.
     'Not only X, HASTA Y came and HASTA Z came.'
The contradiction in (22-23) derives from the scalar endpoint-marking value of \( \textit{hasta/-tak} \), as opposed to the non-endpoint-marking value of \( \textit{incluso/bhii} \), seen in (20-21) above. By marking \( Y \) with \( \textit{hasta/-tak} \), speakers commit themselves to an interpretation in which \( Y \) is considered the most extreme value on the pragmatic scale in question. Thus it is not possible to also mark \( Z \) with \( \textit{hasta/-tak} \).

The contradiction which arises in (22-23) is the same one found in durative (prepositional) uses of \( \textit{hasta} \). Compare (24a) and (24b):

(24a) Viajaron \textbf{hasta} Holanda.
‘They traveled as far as Holland.’
(24b) *Viajaron \textbf{hasta} Holanda y \textbf{hasta} Rusia.
‘They traveled as far as Holland and as far as Russia.’

Once it is made clear that the trip in question consisted of two (or more) temporally separate legs, then the sentence is fine:

(24c) Viajaron \textbf{hasta} Holanda y luego \textbf{hasta} Rusia.
‘They traveled as far as Holland and then as far as Russia.’

Exactly the same restrictions hold for Hindi –\( \textit{tak} \) in its durative use, as illustrated by the examples in (25):

(25a) Riinaa pichle saal amriikaa-\textit{tak} ho-kar aayii.
Reena last year America-\textit{TAK} go came
‘Last year Reena traveled as far as America.’
(25b) *Vo pichle saal amriikaa-\textit{tak} aur austreliia-\textit{tak} ho-kar aayii.
She last year America-\textit{TAK} and Australia-\textit{TAK} go came
‘Last year she traveled as far as America and as far as Australia.’
(25c) Vo pichle saal amriikaa-\textit{tak} aur uske-\textit{baad} austreliia-\textit{tak} ho-kar aayii.
She last year America-\textit{TAK} and that-after Australia-\textit{TAK} go came
‘Last year she traveled as far as America and then as far as Australia.’

5. \textbf{Interactions with Other Constructions}

5.1. Concessive Conditionals

It is typical to analyze concessive conditionals expressing the meaning of “even if \( p, q \)” as asserting that \( q \) holds “no matter what” (Kö nig 1986; Iatri doul 1994; Montolío 1999). However, the “no matter what” reading appears to be conversationally implicated, as illustrated by the contrast between (26a) and (26b). In (26a), there is a potential implicature that class will be held no matter what, but (26b) shows that this implicature can be cancelled by the addition of a more extreme condition under which \( q \) will no longer hold:
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(26a) Even if it snows, we’re going to have class.
(26b) Even if it snows, we’re going to have class, but if we get hit by a blizzard, class will be cancelled.

What (26b) shows, then, is that concessive conditionals assert “extreme” but not “endpoint” conditions: they simply effect a comparison between some condition which pragmatically entails that q will occur under “less extreme” conditions (e.g., when weather is “normal”).

Given this fact about concessive conditionals, and the differences seen above between the two sets of particles with respect to endpoint-marking, we predict that incluso/-bhii, but not hasta/-tak will be compatible with concessive conditional constructions. This is indeed what we find in (27) and (28):

(27) **Incluso/#Hasta** si llueve, van a jugar el partido.
     ‘Even if it rains, they’re going to play the game.’

(28) Agar baarish-**bhii/#-tak** ho ham jaajenge.
     if rain-BHII happens we will-go
     ‘Even if it rains, we’ll go.’

The asymmetry between the Spanish particles in concessive conditionals is further supported by spoken and written corpus data. In the Real Academia Española’s online CREA corpus (~150 million words), over 200 examples of incluso *si* concessive conditionals are found, as opposed to a mere five examples introduced by hasta *si*. Crucially, every example of an hasta *si* concessive conditional is clearly construable as marking an endpoint condition, thereby implying that the main clause proposition q does indeed hold “no matter what”.

5.2. Comparative Sentences
Given the inherently relative nature of comparative sentences, especially comparatives of “inequality”, we predict that incluso/-bhii will be the preferred choices in these contexts as well. This prediction is again borne out by the data:

(29a) Javier es **incluso/#hasta** más inteligente que Marta.
     ‘Javier is even more intelligent than Marta.’

(29b) Javier es **incluso/#hasta** menos inteligente que Marta.
     ‘Javier is even less intelligent than Marta.’

(30a) Riitaa-to Ravi-se-**bhii/#-tak**-se zyaadaa akalmand hai.
     Riitaa-top Ravi-than-BHII more intelligent is
     ‘Rita is even more intelligent than Ravi.’

(30b) Riitaa-to Ravi-se-**bhii/#-tak**-se kam akalmand hai.
     Riitaa-top Ravi-than-BHII less intelligent is
     ‘Rita is even less intelligent than Ravi.’

However, if what one wishes to express is not only a relative comparison between two entities, but also the endpoint status of one entity, then either particle is felicitous as the endpoint marker (recall that incluso/-bhii, though not inherently endpoint-marking, are nonetheless compatible with endpoints):
(31) Javier es **incluso** más inteligente que Marta. De hecho, es **incluso/hasta** el más inteligente de toda la clase.
   ‘Javier is even more intelligent than Marta. In fact, he’s even the most intelligent in the whole class.’

(32) Rīt̪aa-to Ravi-se-bhīi zyaadāa akalmand hai.
    Rīta-top Ravi-than-BHII more/ tāk-se zyaada akalmand hai.
    ‘Asal-mē, vo saariī kłaas-se-bhīi/-tāk-se zyaada akalmand hai.
    in-fact, she whole class-than-BHII/-TAK-than more intelligent is
    ‘Rita is even more intelligent than Ravi. In fact, she is smarter than the entire class.’

6. **Conclusion**

In this paper, we have demonstrated that the distinction between absolute (inherently endpoint-marking) and relative (not inherently endpoint-marking) scalar particles, first proposed by Schwenter (1999) for Spanish, has cross-linguistic validity, as shown by the parallel Hindi distinction between –tak and –bhīi. In addition, we have shown that the contextual dependence and “scalar strength” of scalar additive particles are properties which are not independent of each other. Rather, a particle’s scalar strength is derivable as a consequence of its contextual requirements.

In broader cross-linguistic perspective, a prediction that can be made based on the foregoing analysis is the following: if a language has only one scalar additive particle, it will be relative, not absolute, in nature, since the former type is compatible with both non-endpoint and endpoint interpretations. This prediction is already supported by English, whose only scalar additive particle (even) is of the relative type. Put a bit differently, our claim is that the inherently comparative meaning of relative scalar particles is more basic with respect to communicative function. Absolute scalar particles, which by definition require no anchoring to a contextually-accessible proposition, must necessarily signal the endpoint of a pragmatic scale. As a result, they have a domain of application which is considerably more restricted than that of relative scalar particles.

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1. Introduction

The ultimate source of more grammaticized forms in languages is understood to be lexical. Most commonly, the source categories are nouns and verbs. The development of a gram (Bybee, Perkins and Pagliuca 1994) may be traced along a grammaticization pathway, with vestiges of each stage often remaining viable in the current grammar, so that even synchronically, lexical and grammatical items that share similar form can often be shown to be related. Thus the origins of grammar, at least for spoken languages, are found in older lexical items.

While investigations of grammaticization in American Sign Language (ASL) are still scarce, we suggest that similar diachronic processes do exist for signed languages, but with one essential difference resulting from signed languages occurring within a visual medium, where gestures of the hands and face act as the raw material from which formalized linguistic signs emerge. A crucial link between gesture and more formalized linguistic units has been proposed by Armstrong, Stokoe and Wilcox (1995), for example. Further, the recent suggestion that mirror neurons may provide evidence of a neuro-physical link between certain gestural (and observed) actions and language representation (Rizzolatti and Arbib 1998) strongly supports the idea that signed languages are not oddities, but rather that they are in keeping with gestural origins of language altogether.

This proposal, that pre-linguistic hand and facial gestures are the substrate of signed language linguistic units, allows for the possibility that when exploring grammaticization pathways, we may look not only to lexical material as the sources of newer grams, but to even earlier gestures as the sources of the lexical items that eventually grammaticize. This is the case for the category of modality, which we will illustrate by proposing that the development of modals such as FUTURE, CAN and MUST take as their ultimate source several generalized pre-linguistic gestures. Topic marking, which we propose developed from an earlier yes/no question construction, has an equally generalized gesture as its source. In the case of the grammaticized modals, the resulting forms can be shown to have passed through a lexical stage as might be expected. The process from gestural substrate to grammar for the topic marker, however, never does pass through a lexical stage.

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1 We wish to thank Sherman Wilcox for many informative discussions on this topic. The second author gratefully acknowledges support from SSHRC Grant No. 752-95-1215.
We conclude that grammaticization processes do take place in ASL, a signed language. The evidence presented here suggests that the precursors of these modern day ASL grammatical devices are gestural in nature, whether or not a lexical stage is intervening. The study of ASL then, provides new perspectives on grammaticization, in exploring both the sources of grams, and the role (or lack of role) of lexicon in the developing gram.

2. Markers of modality
For the grammatical category of linguistic modality, the path proposed in Shaffer (in preparation) and described here is:

(1) gesture > full lexical morpheme > grammatical morpheme

Markers of modality seen in ASL have been hypothesized as having developed along predictable grammaticization paths described for modality in other languages. Bybee, Perkins and Pagliuca (1994) state that future grams in all languages develop from a limited pool of lexical sources and follow similar and fairly predictable paths. Future grams may develop from auxiliary constructions with the meanings of >desire, = >obligation, or >movement towards a goal, = We believe that ASL is among those languages whose main future gram developed from a 'movement towards a goal' source.

2.1. FUTURE
The claim here is simple: the future gram in ASL, the sign glossed FUTURE, developed from an older lexical sign with the meaning >go, = Evidence of this sign is found as far back as 1855 in France where it was glossed PARTIR. The sign was used as a full verb with the meaning >to leave, = It was produced with two open handshapes, the non-dominant hand palm down, and the dominant hand thumb up. The dominant hand began just above waist level, then moved upward until it made contact (at the wrist) with the palm of the non-dominant hand. Note that the sign is a two-handed sign. Old ASL also shows evidence of this sign, but with one difference. There is evidence from 1913 of GO (as in PARTIR) being signed as described above, but there are also instances of GO being signed with only one hand.

E. A. Fay in 1913 signs the following:

(2) 2-3 DAY PREVIOUSLY E.M.GALLAUDET GO TO TOWN
PHILADELPHIA

'Two or three days before, (EM) Gallaudet had gone to Philadelphia.'

2 All references to the 1913 data indicate filmed (transferred to video) narratives available on The Preservation of American Sign Language, ©1997, Sign Media Inc.
3 ASL signs are represented as upper case glosses. Words separated by periods indicate single signs; hyphens indicate compounded signs; PRO.n = pronouns (1s, 2s, etc.); POSS.n = possessive pronouns; letters separated by hyphens = fingerspelled words; [...] = TOP = topic marking; [...] = Y/N-Q = yes/no question marking; Cl = classifier; DEM = demonstrative index; subscript letters = spatial loci.
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In this context the sign very clearly has the meaning >go.= The speaker is making a past time reference and stating that Gallaudet had gone to Philadelphia. What is striking is that GO is signed in a manner identical to the older form of FUTURE. Take for example another utterance filmed in 1913, given in (3).

(3) WHEN PRO.3 UNDERSTAND CLEAR WORD WORD WORD OUR FATHER SELF FUTURE(old) DO THAT NO MORE
   'When he clearly understands the word of our father he will do that no more.'

This example, signed by R. McGregor, shows the same form, the one-handed GO, being used to indicate future time, suggesting that for a period a polysemous situation existed whereby the sign could be understood in certain constructions to mean either >go= or >future.=

A further grammaticization of FUTURE was also occurring at the turn of the century. Phonological reduction in the signing space is evident by this time. Note the following example, where G. Vedtitz produces two variants of FUTURE in the same utterance.

(4) YEAR 50 FUTURE(new) THAT FILM FUTURE(old) TRUE
    P-R-I-C-E-L-E-S-S
    'In fifty years these films will be priceless.'

While FUTURE is produced twice in this sentence, its articulation is markedly different. In the second instance the sign resembles FUTURE as produced by McGregor in (3), while in the first instance FUTURE is signed in a manner consistent with modern ASL FUTURE, which moves forward from the cheek.

In summary then, FUTURE began in Old LSF (French Sign Language) as a full verb meaning >to leave.= By the turn of the century Old ASL evidenced both GO as it was produced in 1855 with the non-dominant hand as an articulated >base= hand, and GO without the non-dominant hand. Further, in 1913 a similar form, without the base hand, was used to indicate future time reference, as was a newer form phonologically similar to the form used today. Note, however, that PARTIR as it was signed in 1855 still exists in modern LSF, and a related form commonly glossed as LET=S.GO is seen in ASL.

What we have described to date is in keeping with grammaticization theory as proposed by Bybee et al. (1994), Hopper (1991), Traugott (1989) and others. We have described semantic and phonological changes a morpheme (FUTURE) underwent as it grammaticized from a full verb to a grammatical morpheme. Here however, we must depart from traditional grammaticization theory. We claim now that the modern ASL (and LSF) sign FUTURE has an earlier origin than the lexical sign PARTIR, namely a gesture in use in France at the time, and one we suggest was
available to either deaf or non-deaf groups of language users. In fact the gesture is still in use among non-signers in France. It is a very common French gesture, known to most any member of the French speech community and has the understood meaning >go= or >let=s go.=

What we are claiming then is that the source of FUTURE in ASL was a gesture used in France, which entered the lexicon of LSF, and then proceeded down a common grammaticization path. The resulting path looks something like (5):

(5) gesture >go= > full verb >go= > grammatical morpheme >future=

We suggest that gesture is in fact a common source of modern ASL lexical and grammatical morphemes. We will now provide several other examples of gestural sources for ASL grammatical morphemes.

2.2. CAN

In a discussion of markers of possibility, Bybee et al. (1994) note that there are several known cases of auxiliaries predicating physical ability that come to be used to mark general ability as well. Two cases are cited. English may was formerly used to indicate physical ability and later came to express general ability. The second case noted is Latin potere or possum >to be able,= which is related to the adjective potens meaning >strong= or >powerful= and which gives French savoir and Spanish poder, both meaning >can= (1994:190). Wilcox and Wilcox (1995) and Shaffer (in preparation) have suggested that a similar grammaticization path can be seen for markers of possibility in ASL. Evidence from Old ASL suggests that the lexical sign STRONG has grammaticized into the sign CAN which is used to indicate physical ability, mental ability, root possibility, as well as permission and epistemic possibility.

Here again we claim that the source can be traced further back, to a gesture indicating physical strength. Evidence from existing Old ASL sources supports the claim that CAN is a grammaticization of STRONG. McGregor, in a 1913 lay sermon, signs the sentences given in (6) to (8):

(6) WE KNOW EACH OTHER BETTER AND WE CAN UNDERSTAND EACH OTHER BETTER AND FEEL BROTHER
‘We know each other better and are able to understand each other better and feel like brothers.’

(7) OUR FATHER STRONG OVER MOON STARS WORLD
‘Our father has power over the moon, and stars and world.’

(8) SELF CAN GET ALONG WITHOUT OUR HELP
‘He can get along without our help/He is powerful without our help.’

In (7) it is unclear whether the signer was intending a strength or possibility reading. Either meaning is possible and logical in sentence (7). This provides good
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evidence for the development of CAN in ASL from STRONG. In each of the above articulations the sign STRONG and the sign CAN are signed in an identical manner. Shaffer (in preparation) suggests the following path for modern ASL CAN:

(9)  gesture >strong= >lexical >strong= >grammatical morpheme >can= >epistemic >can=

Evidence from 1913 suggests that by the turn of the century CAN had already undergone a great deal of semantic generalization from its physical strength source. The 1913 data contain examples of each of the following discourse uses of CAN: physical ability, non-physical ability (skills, etc.) and root possibility. Examples of permission uses of CAN are not found in this diachronic data, nor are epistemic uses seen. Shaffer (in preparation) suggests that epistemic CAN is quite new and is the result of a semantic extension from root possibility uses, in conjunction with its sentence-final placement and concomitant non-manual marking.

While there is abundant cross-linguistic evidence to support a claim that the core marker of possibility in ASL developed from a lexical sign with the meaning >strong= or >power=, the claim we make here is that STRONG, the lexical sign, does not represent the ultimate source of the grammaticization path described. Instead, we claim that STRONG entered the ASL lexicon as a gesture. STRONG in both Old ASL and modern ASL is highly iconic, the very gesture non-signers might use to visually represent physical strength. Our claim here is that a ritualized gesture in use among signers and non-signers alike entered the lexicon of Old LSF, and then grammaticalized to indicate any kind of ability, both physical and non-physical. It then generalized further to be used to indicate permission, and even epistemic possibility.

2.3. MUST

Turning to ASL MUST, Shaffer (in preparation) posits another gestural source, namely a deictic pointing gesture indicating monetary debt. This pointing gesture entered the lexicon by way of Old LSF as a verb indicating monetary debt, DEVOIR, then underwent semantic generalization which resulted in uses where no monetary debt was intended, only a general sense of >owing=. Further reduction, which resulted in uses without a base handshape, led to the development of general necessity in ASL, and subsequently to the development of modern ASL MUST and SHOULD. The grammaticization path suggested for MUST is:

(10)  gesture >owe= > OLSF verb >owe= >LSF/ASL >must=, = >should= >epistemic >should=

The 1913 data suggest that by the turn of the century the ASL sign OWE (the counterpart to the OLSF sign DEVOIR) was still in use, with and without a financial component to its meaning. MUST was also in use, with discourse uses ranging from participant external necessity and advisability, to participant internal necessity and

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advisability. Uses with deontic or authoritative sources are also evident. Epistemic uses of MUST (and SHOULD) are not seen in the diachronic data, but are fairly common in modern ASL (see Shaffer in preparation).

In summary then, a look at the grammaticization of FUTURE, MUST and CAN in ASL traces their sources to the point where gesture enters the lexicon. FUTURE, MUST and CAN, we argue, each have gestural sources, which, through frequent use and ritualization, led to the development of lexical morphemes, then to the development of grammatical morphemes indicating modal notions. Shaffer (in preparation) suggests gestural sources for other ASL modals such as CAN'T, while Wilcox and Wilcox (1995) hypothesize gestural origins for markers of evidentiality (SEEM, FEEL, OBVIOUS) in ASL as well.

3. The grammaticization of topic
As we have seen, several grammaticization paths can be described for ASL which follow conventional thinking regarding the development of modal meaning in language, save the important links to the source of the lexical items being grammaticized. For ASL these sources are pre-linguistic gestures.

Here we present an additional grammaticization path that also begins with such a gesture, and results in a highly grammaticized functional category, that of topic-marking. The significant difference, however, is that this path appears not to have an identifiable lexical word conventionalize from the gestural source, and thus intervene between the gesture and the final grammatical item. The pathway proposed, adapted from Janzen (1998), is given in (11).

(11) communicative yes/no pragmatic syntactic textual
    questioning > questions > domain > domain > domain
    gesture topics topics topics

3.1. The communicative questioning gesture
The gesture proposed as the origin of the yes/no question marker, and eventual topic marker, is an eye-brow raise. Quite conceivably, when accompanied by deliberate eye contact with someone the gesturer intends to communicate with, this gesture suggests an openness to communicative interaction. In other words, the gesture invites interaction by displaying an interest in interaction.

This gesture, under the right circumstances, might invite a response to an obvious query about something. In fact, in modern North American society, holding an item in one=s hand, such as a drink, and lifting it up while gesturing to a friend by raising the eyebrows, and perhaps nodding the head toward the friend, is easily recognizable as Do you want a drink? This iconic gesture, then, is seen as a motivated choice in being co-opted into the conventionalized, but still gestural, language system of ASL.

The ease of understanding such a signal might mean that it is a good candidate as an effective communication strategy, and thus a plausible beginning point from which to build more complex and symbolic constructions. Its conventionalization in yes/no constructions in ASL would suggest that this is the case.

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3.2. Yes/no questions
The effectiveness of a communication strategy is likely to lead to repetition, and once ritualized (cf. Haiman 1994), can become obligatory. The raised eyebrows gesture has thus become the obligatory yes/no question marker in ASL, usually along with a forward head tilt, although the appearance of this accompanying gesture seems less obligatory (Baker and Cokely 1980, Liddell 1980).

In an ASL yes/no question, the entire proposition being questioned is accompanied temporally by raised eyebrows (and again the less obligatory, but frequent, forward head tilt) and continuous gaze at the addressee. An alternation in word order to indicate the question does not take place. Examples are given in (12) and (13).

(12) [FINISH SEE MOVIE PRO.2]-Y/N-Q  ‘Did you already see that movie?’  (Baker and Cokely 1980:124)

(13) [SEE PRO.1 PRO.2]-Y/N-Q pause  ‘Did you see me?’  (Janzen 1998:93)

The pre-linguistic raised-eyebrow gesture itself may not be particularly meaning-specific. Pragmatic considerations surrounding the communicative interchange may contribute to its being inferred as a gesture indicating interest or intentness, or that a question is being asked. The gesture as a yes/no question marker in ASL, however, is specific in meaning, marking any string as a yes/no question. A pre-linguistic gesture, then, has been recruited as a grammatical marker, and it would be difficult to claim that either is a lexical item. In this case, it appears that a grammatical marker, albeit a rather iconic one, takes as its source a more general communicative gesture, with no lexical word developing or intervening at this stage of grammatical development or later, as discussed in the section below.

3.3. From yes/no questions to topic marking
Topics in ASL essentially take the form of yes/no questions, but function very differently in discourse. It is not uncommon for yes/no question marking and topic marking to employ the same marker (see Haiman 1978). For ASL this is also apparent, and ASL topic marking may be seen as representing a later stage of grammatical development. The same gesture of raised eyebrows indicates a topic in ASL, but rather than a forward head tilt, the head may optionally tilt backward. This in itself is worthy of note. Whereas the forward head tilt in a yes/no question invites a response, and is thus highly interactive in design, the topic-marked construction has the form of a yes/no question, but the backward head tilt may be thought of as an iconic gesture away from such invitation. The signer does not wish for any response to the ‘question’ formCthe addressee must read this construction as providing a ground for some ensuing piece of discourse, or as a ‘pivot’ linking some shared or
presupposed information to something new. One discourse example is given in (14).

\[(14)\] a. \([\text{TRAIN ARRIVE}(\text{extended movement}, \text{fingers wiggle}) \ T-H-E \ P-A-S]-\text{TOP} \]
\(\text{CL: bent } V(\text{get off vehicle})\)

'‘The train eventually arrived at The Pas, and we got off,’

b. \(\text{OTHER TRAIN pause } [T-H-E \ P-A-S]-\text{TOP TO LYNN LAKE} \)
\(\text{DEM(c vertical to d)}\)

'‘and took another train north from The Pas to Lynn Lake.’

c. \(\text{THAT MONDAY WEDNESDAY FRIDAY SOMETHING THAT} \)
\(\text{DEM CL:A(c\text{?d}\text{?c}) THAT} \)

'‘That train runs Mondays, Wednesdays, and Fridays-something like that.’

d. \([1,3,\text{DUAL.INCL}]-\text{TOP CHANGE CL: bent } V(\text{get on vehicle}) \ T-R-A-I-N \)

'‘We changed trains.’

e. \(\text{ARRIVE C-R-A-N-B-E-R-R-Y P-O-R-T-A-G-E} \)

‘and arrived at Cranberry Portage.’

f. \([\text{CL: bent } V(\text{get off vehicle})]-\text{TOP TAKE.UP DRIVE GO.TO FLIN FLON} \)

'‘We got off (the train), and took a car to Flin Flon.’

As this discourse segment shows, the topic-marked constituent may be nominal or clausal (other elements such as temporal adverbials are also frequently topic-marked), and has the same formal marking as do yes/no questions, but its function in the discourse is very different. The construction is emancipated from the true interactive function of yes/no questions, and has assumed a purely grammatical function. The marker now indicates a relationship between parts of the discourse text, that is, how one piece of information relates to the next. As mentioned, this is a grounding or ‘pivot’ function in the text.

In the grammaticization path given in (9) above, ‘syntactic domain topics’ are suggested as a later stage than ‘pragmatic domain topics.’ While the details of this differentiation are not addressed here (see Janzen 1998, 1999), it is thought that information from interlocutors’ shared world of experience is available to discourse events before information that arises out of the discourse event itself is available as shared information. In other words, cognition precedes expression. Essentially, however, marked topics that draw presupposed information from interlocutors’ shared world of experience or from prior mention in the discourse are marked in the same manner.

The gestural eyebrow raise in these cases does not mark the full range of yes/no question possibilities, but only one: \(\text{do you know } X?\) Notice however, that even though this may suggest that the construction described here as a topic still appears to be very question-like, it clearly does not function in this way. Consider the functional practicality of such ‘questions’ as those posed in (15), drawing on the text example in (14d and f) above:

\[(15)\] a. Do you know ‘the two of us’?

b. Do you know ‘the act of getting off the train’?
These are not yes/no questions that make any communicative sense. Rather, they are grammaticized constructions marked in the same form as are yes/no questions, but with grammatical function.

3.4. **Textual domain topics: A further grammaticization step**

The most highly grammaticized use of topic marking appears in ASL not as marking constituents containing shared information, but as grammatical discourse markers. While the pragmatic and syntactic domain topics relate relevant pieces of presupposed and new information in the text, we propose that the construction form along with topic marking has further grammaticized to have a textual cohesion-marking function, following the semantic-pragmatic change Traugott (1989) suggests as propositional > textual (or > expressive). Here it is proposed that the primary motivation for this grammaticized function is the topic as pivot. In this case, the shared information-linking function of the topic has been lost; the examples below show that what is marked with the topic marker is not information from interlocutors' world of experience, nor anything previously mentioned, but is instead information about the text construction itself.

(16) WHAT=S.UP GO.TO RESTAURANT EAT-CONT, [BE.FINISHED]-TOP, TAKE.ADVANTAGE SEE [TRAIN ARRIVE]-TOP
    ‘So then, we went to a restaurant, ate, and then got to see the train arrive.’

(17) 1s [lh:3s POSS.1s GOOD.FRIEND]-TOP 3s SAY DEM ALCOHOL IN [WHY]-TOP lh:POSS.3s MOTHER PREVIOUS WORK ALCOHOL STORE
    ‘(I...) my best friend said she knew there was alcohol in it because her mother had worked in a liquor store before.’

    ‘The first (exercise) is called “Phonemic Shadowing”. (...)’

In (16) and (17) the topic-marked connective acts as a discourse pivot, and can hardly be called a ‘topic’ at this point. In (18), similarly, the pivot is an ordering device. As mentioned, information about the world is not a factor here, but predictable text organization is. The addressee in these cases is assumed to be fluent in such ASL discourse strategies; the shared information is now about text structure. Thus, this grammatical use of the brow raise gesture has arisen, likely as an analog of the whole construction functioning as a discourse pivot, having been emancipated first from the interactive function that a yes/no question has, and secondly abstracting away from the type of information contained in the topic-marked constituent. The result is a construction very similar in form, but a grammatical text-cohesion device.
Historically, there is little recorded evidence to suggest when these grammatcized stages have appeared in ASL, but by the time of some of the earliest recorded texts in 1913, this text-cohesion function was already in use. Example (19), in the Hotchkiss text, shows this marker on an event ordering construction, similar to (18) above.

(19) HELP IN TWO WAY-REP [FIRST]-TOP LEAD POSS.3 WALK-REP...
    ‘...helped in two ways, first, by leading him (on his) walk...’

The examination of this grammatcization cline shows that for whatever reason, at least when linguistic conditions are apparent, a lexical stage along the pathway is not required for the grammatcization of an item. Whether or not the language modality (signed gestures as opposed to vocal gestures) is the factor that allows this phenomenon is open to question, but the fact that gestures of the hands and face are of the same medium as linguistic signals may be significant.

4. Conclusion
Grammatcization processes for spoken languages are well-understood to be systematic and pervasive. Diachronic research in the last few decades has brought to light a vast array of grammatical constructions for which earlier lexical forms can be shown as their source. The systematicity within grammatcizing categories is such that in many languages, polysemous grammatical and lexical items are often thought to be evidence of grammatcization, even in the absence of detailed diachronic evidence.

Grammatcization studies on signed languages are rare, but the examples we have outlined show the potential for signed languages to develop in like manner to spoken languages in this respect. In other words, how would grammatical categories in a signed language emerge, except by the very same processes?

Several studies have shown that components of generalized, non-linguistic gesturing are evident in ASL: in the phonetic inventory (e.g. Janzen 1997), the routinized lexicon (Shaffer, in preparation), and in syntactic and morpho-syntactic relations (Armstrong et al. 1995). The present study, however, shows that the role that gesture plays in the development of grammatical categories is also critical, and not opaque when viewed through the lens of grammatcization principles. This study offers something unique to grammatcization theory as well, for two reasons.

First, it is interesting to see the process of gesture > lexical form > grammatical form as illustrated by the development of modals in ASL. Not only can we see grammatical forms arise, but also lexical forms as an intermediate stage in the whole process. Second, we have seen an instance of grammatical form arising not via any identifiable lexical form, but directly from a more generalized gestural source. This does not cast doubt on the crucial and pervasive role that lexical items do play in the development of grammar, but suggests that under the right circumstances, this diachronic stage may be bypassed. How this might take place, and what the conditions are for such grammatcization phenomena, have yet to be explored. As well there is great potential for studying the development of additional modal and auxiliary forms in ASL and other signed languages as features of grammatical structure.
References


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Prominence, Augmentation, and Neutralization in Phonology

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1. Introduction
Certain phonological phenomena, such as the lengthening of vowels in stressed syllables or the attraction of stress to heavy syllables, are best accounted for by means of markedness constraints that make specific reference to strong positions (M/str constraints). However, not just any markedness constraint can be relativized to strong positions. If an ordinary featural markedness constraint such as *MidV (‘output forms do not contain mid vowels’) were given an M/str counterpart specific to stressed syllables, *MidV/ŒŒ, the system would predict the existence of languages that have a full vowel inventory in unstressed syllables but ban mid vowels in stressed syllables X an unattested pattern.

This paper develops a theory of M/str constraints that correctly allows for those that are empirically attested, while ruling out problematic constraints like the putative *MidV/Œ. The basis of the proposal is the Prominence Condition, a restriction that holds of the universal constraint inventory such that the only legitimate M/str constraints are those that enhance prominence.

The discussion proceeds as follows. First, section 2 presents the proposal. Section 3 then gives an analysis of ‘augmentation’ and ‘attraction’ phenomena based on prominence-enhancing M/str constraints. Section 4 shows why constraints like *MidV/Œ, which are ruled out by the Prominence Condition, would predict unattested language types if they were assumed to be possible constraints. Finally, section 5 presents conceptual and empirical justification for the proposal.

2. M/str constraints and the Prominence Condition
In order to account for languages that require vowels in stressed syllables to lengthen or to bear tone, there must be M/str constraints like HEAVYŒ/Œ, ‘Stressed syllables are heavy’, and HAVETONE/Œ, ‘Stressed syllables bear tone’ (see section 3 for examples and discussion). However, there must not be featural-markedness M/str constraints such as *MidV/Œ, ‘Stressed syllables do not contain mid vowels’ (see section 4). That is, the grammar must be allowed to include certain kinds of M/str con-

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1 Thanks to John McCarthy, Lisa Selkirk, Joe Pater, John Kingston, Cheryl Zoll, Paul de Lacy, members of the UMass Phonology Group, and audiences at BLS 26 and the MIT Phonology Circle for comments and discussion. Any errors are my responsibility. This research was partially supported by the National Science Foundation under grant SBR-9420424 and by an NSF Graduate Research Fellowship.

2 HEAVYŒ/Œ is equivalent to the Stress-to-Weight Condition (Prince 1990) and is one possible implementation of the OT constraint schema or hierarchy PK-PROM (Prince & Smolensky 1993).
strains, but not just any logically possible M/str constraint. This result is achieved with the following condition on M/str constraints.

(1) The Prominence Condition

A markedness constraint can be relativized to a strong position only if it acts to enhance the prominence of that position.

Markedness constraints (sometimes called structural constraints, phono-constraints, or well-formedness constraints) are constraints that make reference only to output forms; that is, constraints for which information about input forms, or the correspondence relation between input and output forms, is irrelevant in assessing violations. Strong positions are positions that show special feature-licensing abilities and resistance to "positional neutralization" by virtue of their special phonetic or psycholinguistic status (see Beckman 1998, Casali 1996, and references therein) X phonetically strong positions include syllable onsets (more accurately, released consonants), long vowels, and stressed syllables (δ); psycholinguistically strong positions include initial syllables (σ), and morphological roots. Prominence is the presence of a property, such as tone or long duration, that gives rise to a comparatively large perceptual response.

Thus, the Prominence Condition ensures that if a markedness constraint requiring property P to hold of output forms is relativized to one of the set of strong positions, then P must be a perceptually salient property. As a result, ordinary featural markedness constraints of the *structure family, such as *MidV or *Labial, which have no relationship to prominence, cannot have M/str counterparts. But the empirically motivated M/str constraints discussed in section 3, such as Heavyσδ, HaveTone/σ, and HaveStress/Root, all pass the Prominence Condition, so they are legitimate constraints.

3. Phonological requirements for strong positions
This section introduces a number of phonological phenomena that motivate M/str constraints. First, examples of augmentation effects for the strong position stressed syllable are presented, as when stressed syllables are required to be heavy, to bear tone, or to have onsets (§3.1). The same M/δ constraints that account for augmentation are then shown to account for attraction of stress to syllables having length, tone, or low-soberity onsets, i.e., the patterns seen in what are traditionally called unbounded stress systems (§3.2). Examples of M/str constraints for other strong positions are given in §3.3.

3.1. Augmentation of stressed syllables
Stressed syllables are sometimes augmented with properties such as syllable weight, tone, and (low-soberity) onsets. Representative examples of stressed-syllable augmentation are given in (2); for detailed discussion and additional cases, see Smith (in prep.) and references therein.

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3 This use of the term augmentation is inspired by Zoll (1998), who observes that processes involving "augmentation of the input" can target strong positions.
Prominence, Augmentation, and Neutralization

(2) Stressed-syllable augmentation effects

a. ə becomes heavy  Mohawk (Michelson 1988)  
b. ə acquires a tone  Slave (Rice 1987)  
c. ə epenthesizes an onset  Dutch (Booij 1995)  
d. ə rejects a high-sonority onset  Niuafo'ou (de Lacy 2000)

Phonological requirements like these are taken to be the effect of markedness constraints, which enforce phonological well-formedness. The phenomena in (2) are evidence for the existence of the following constraints.

(3) Markedness constraints specific to stressed syllables (M/ə@ constraints)

a. HEAVYσ/ə  For all x, if x is a σ@, then x is heavy (bimoraic).  
b. HAVETONE/ə  For all x, if x is a σ@, then x bears tone.  
c. ONSET/ə  For all x, if x is a σ@, then x has an onset.  
d. [*ONS/X]/ə  For all x, if x is a σ@, then the onset of x is not X.

(This is a ə-specific version of the sonority-based *ONS/X mark-edness hierarchy, i.e., [*ONS/GLIDE]/ə >> [*ONS/LIQUID]/σ@ >> ... >> [*ONS/STOP]/σ; cf. the *MARGIN/X hierarchy of Prince & Smolensky 1993.)

In each of the languages in (2), the relevant M/ə constraint outranks the antagonistic faithfulness constraint that would act to prevent changes in weight, tonal association, or onset structure. Also undominated is whatever constraint determines the location of stress in that language, such as an alignment constraint or a faithfulness constraint on underlying metrical structure. To ensure satisfaction of both the M/ə constraint and the stress-location constraint, faithfulness to weight/tone/onset is violated and augmentation of the stressed syllable occurs.

(4) Stressed syllables are augmented with a prominent characteristic

Example: HEAVYσ/ə, ALIGN-L(ə) >> FAITH(μ)

<table>
<thead>
<tr>
<th>Input: /CVCVVC/</th>
<th>HEAVYσ/ə</th>
<th>ALIGN-L(ə)</th>
<th>FAITH(μ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. <a href="mailto:CV@.CV">CV@.CV</a>,CVC</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. CV,CV@C</td>
<td></td>
<td>**!</td>
<td></td>
</tr>
<tr>
<td>c. CV@&quot;,CV,CVC</td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

⇒ Result for this ranking: Stress always initial; stressed syllable lengthens

3.2. Stress attraction

If the ranking between the stress-location constraint and the faithfulness constraint in (4) is reversed, with the M/ə constraint still undominated, then a different kind of language is produced: one in which faithfulness to length, tone, or onset is maintained, so that the M/ə constraint is satisfied at the expense of the stress-location constraint.
The individual syllables do not change their characteristics, but the location of stress is determined by the location of the syllables that are already prominent.

(5) Stress is attracted to prominent syllables

Example: HEAVYσ/σ, FAITH(μ) >> ALIGN-L(σ)

<table>
<thead>
<tr>
<th>Input: /CVCV/CVC/</th>
<th>HEAVYσ/σ</th>
<th>FAITH(μ)</th>
<th>ALIGN-L(σ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. <a href="mailto:CV@.CV.CVC">CV@.CV.CVC</a></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. CV.CV.CV@C</td>
<td></td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>c. CV@&quot;@.CV.CVC</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Result for this ranking: Stress falls on leftmost heavy syllable

The pattern represented in (5) is precisely that found in so-called 'unbounded stress systems', in which the location of stress is determined by the location of certain prominent characteristics. Thus, under the current proposal, stress attraction ('unbounded stress') follows directly from a different ranking of the M/σ constraints that are independently needed to account for stressed-syllable augmentation effects.

Furthermore, because augmentation and attraction are driven by the same M/σ@ constraints, this account predicts that stress attraction should be sensitive to the same inventory of prominent properties that are involved in stressed-syllable augmentation. As shown in (6), the prediction is borne out. The properties of weight, tone, and onset sonority profile are all involved in stress attraction (cf. (2)).

(6) Stress attraction effects

a. Attracted to heavy σ
b. Attracted to high-toned σ
   Hindi (Hayes 1995)
   Serbo-Croatian (Inkelas & Zec 1988)
c. Attracted to σ with onsets
   Arrernte [Aranda] (Strehlow 1942)
   Pirahã (Everett & Everett 1984)
d. Attracted to σ with low-tonority onsets

In summary, languages with stressed-syllable augmentation effects alter input material to satisfy an M/σ constraint without affecting stress placement; languages with stress attraction force stress to fall on a syllable that already satisfies M/σ, violating the stress-location constraint but respecting faithfulness. Both phenomena are accounted for by means of markedness constraints that make specific reference to the strong position stressed syllable.

3.3. Augmentation of other strong positions

In addition to requirements that hold of stressed syllables, there are requirements on other strong positions as well, providing evidence for additional M/str constraints. A few examples are presented here; see Smith (in prep.) for additional discussion.

In Guhañ Ifugao (Newell 1956; Landman 1999), onsetless syllables are tolerated
medially, but not stem-initially. A constraint that captures this pattern is ONSET/σ₁, which requires initial syllables to have onsets (cf. ONSET/σ in (3c)).

In Campidanian Sardinian (Bolognesi 1998), liquid and glide onsets are banned from initial syllables but permitted in medial syllables. Initial liquids are banned in Korean as well, apart from recent loanwords. Patterns like these are evidence for a σ₁-specific version of the *ONS/X hierarchy, which encourages onsets of initial syllables to have low-sonority onsets (cf. [*ONS/X]/σ in (3d)). The [*ONS/X]/σ₁ hierarchy can also account for many cases of domain-initial fortition, a cross-linguistically common process (for recent discussion, see Lavoie 1999 and Keating et al. to appear).

Several languages show a preference for default or floating stress to be realized on the root rather than on an affix. Examples include Chukchee (Kenstowicz 1994), Tuyuca (Barnes 1996; Smith 1998), and Cupeño (Alderete 1998). This pattern is evidence for a root-specific constraint requiring stress, HAVESTRESS/Root.

3.4. Summary: augmentation and attraction effects
Phonological phenomena observed in a number of languages motivate the inclusion of certain M/str constraints in the universal constraint set. These constraints require strong positions such as stressed syllables, initial syllables, and roots to have prominent properties like weight, high tone, or (low-sonority) onsets. When an M/str constraint dominates an antagonistic faithfulness constraint, the strong position will be augmented with the prominent property demanded by the M/str constraint. To satisfy M/σ constraints, an additional response is possible: stress-location constraints can be violated instead of faithfulness constraints, leading to ‘unbounded stress’ or stress-attraction systems.

4. The need to restrict M/str constraints
The discussion in section 3 has introduced various prominence-enhancing M/str constraints to account for augmentation in strong positions. This section now returns to the Prominence Condition and demonstrates that this restriction on M/str constraints is necessary. First, §4.1 shows why ordinary featural markedness constraints, which do not increase prominence, must not be allowed to have M/str counterparts. Then, §4.2 argues that the analysis of augmentation developed above is preferable to other possible analyses. Since prominence-enhancing M/str constraints are necessary, but other M/str constraints are undesirable, a restriction like the Prominence Condition is crucial.

4.1. Unwanted M/str constraints
Allowing just any markedness constraint to refer to strong positions wrongly predicts that there should be languages with "reverse positional neutralization," in which weak positions license featural contrasts that are neutralized in strong positions. For example, postulating a featural M/str constraint like *MidV/σ, which bans mid vowels in stressed syllables, allows for languages with the ranking in (7).

\[4\] Thanks to Paul de Lacy for bringing this example to my attention.
(7) Hypothetical **M/str** constraint: \( ^* \text{MidV/}/ \sigma \)

<table>
<thead>
<tr>
<th>Input: /tépo/</th>
<th>*\text{MidV}/\sigma</th>
<th>\text{FAITH}[\text{Vht}]</th>
<th>*\text{MidV}</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. tépo</td>
<td>*!</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>b. tipo</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>c. típu</td>
<td>**!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

But languages with contrastive mid vowels only in unstressed syllables are in fact unattested. More generally, it is a characteristic of featural positional neutralization effects that they target weak positions, not strong positions (see Beckman 1998 for discussion). So constraints such as *\text{MidV}/\sigma* must not be part of the universal set of constraints.\(^5\)

However, once the formal mechanism of combining markedness constraints with strong positions is allowed into the theory, then without any further restrictions, the option of forming an **M/str** counterpart is technically open to all markedness constraints. The Prominence Condition is needed to eliminate the possibility of unattested and undesirable **M/str** constraints like *\text{MidV}/\sigma*.

4.2. Rejecting alternatives to **M/str** constraints

Another way to keep unwanted **M/str** constraints such as *\text{MidV}/\sigma* out of the constraint set, without invoking the Prominence Condition, would be to find an alternative account for augmentation and simply disallow all **M/str** constraints. However, other conceivable ways of accounting for augmentation are unsuccessful. Since augmentation phenomena affect strong positions, an analysis of augmentation must have some way of distinguishing between strong and weak positions. Faithfulness constraints specific to strong positions (**F/str** constraints) have already been proposed to account for positional neutralization (Beckman 1998, Casali 1996): when **F/str** constraints are high-ranking, they allow their respective strong positions to resist neutralization. However, as Zoll (1998) points out, augmentation effects involve the violation of faithfulness in strong positions, so they cannot possibly be caused by **F/str** constraints.

Another approach to augmentation phenomena might be to use **F/wk** constraints, faithfulness constraints specific to weak positions, instead of **M/str** constraints. For example, the following constraint ranking could be used to account for obligatory lengthening in stressed syllables.

(8) Augmentation with **F/wk** constraints: **F/wk** >> **M** >> **F**

\[ \text{FAITH}(\mu)/\sigma >> \text{HEAVY}\sigma >> \text{FAITH}(\mu) \]

With this ranking, faithfulness to input syllable weight in unstressed syllables has priority over the general markedness constraint banning light syllables (\text{FAITH}(\mu)/\sigma >> \text{HEAVY}\sigma). However, since the general faithfulness constraint is ranked lowest, markedness takes priority for stressed syllables, and they are always heavy (\text{HEAVY}\sigma)

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\(^5\)Not every ranking of a constraint set that includes *\text{MidV/}/\sigma@* produces a grammar that allows "reverse positional neutralization" as in (5). But crucially, some such rankings do lead to unattested grammars. Since there is no principled way to prohibit the problem rankings, *\text{MidV/}/\sigma@* must not be allowed to exist.

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Unfortunately, the F/\text{wk} approach to augmentation fares no better than the M/\text{str} account, because exactly the same kind of problem arises. Allowing featural F/\text{wk} constraints like \textsc{faith}[\text{Vht}] / \checkmark predicts reverse positional neutralization when they are ranked as in (9).

(9) Unwanted F/\text{wk} constraints

\textsc{faith}[\text{Vht}] / \checkmark \gg \text{*MidV} \gg \text{faith}[\text{Vht}] \mid \text{mid V in } \checkmark \text{ only (unattested)}

Furthermore, the F/\text{wk} approach raises additional questions, such as how faithfulness constraints can make reference to weak positions (which may not be available to the grammar in the way that strong positions, being phonetically or psychologically important, are). An analysis of augmentation based on M/\text{str} constraints remains the most attractive option.

5. Justification for the proposal

This section addresses some remaining questions concerning the Prominence Condition, confirming that all attested M/\text{str} constraints do enhance prominence (5.1) and examining the place of prominence-enhancing M/\text{str} constraints in a broader theory of markedness (5.2).

5.1. Empirical justification: onsets enhance syllable prominence

The Prominence Condition states that only prominence-enhancing M/\text{str} constraints can exist, where prominence is defined as the presence of a property that produces a comparatively large perceptual response. If the Prominence Condition is the correct way to distinguish between the empirically attested M/\text{str} constraints in section 3 and the problematic, unattested constraints in section 4, then all properties called for by the attested M/\text{str} constraints must actually be prominent properties.

For many of the M/\text{str} constraints in section 3, the Prominence Condition is clearly met; it is widely accepted that characteristics such as weight, tone, and stress are perceptually prominent. However, the relationship between the Prominence Condition and the M/\text{str} constraints calling for onsets (or for low-sonority onsets) is less obvious. X CV syllables are certainly less marked than onsetless syllables, but that does not entail that syllables with onsets are more prominent than those without. This section presents data from neural response patterns to support the claim that having an onset, and specifically a low-sonority onset, does in fact enhance the perceptual response to a syllable.

Given a constant auditory stimulus such as a tone or a vowel-like sound, auditory-nerve fibers do not discharge at a constant rate. There is an initial response at the onset of the stimulus, followed by a decay in response rate known as adaptation. Adaptation has a physiological origin, because it is apparently caused by depletion of the neurotransmitter that stimulates the auditory-nerve fibers (R. Smith 1979). However, it also plays a role in speech perception:

\[\text{[A]daptation enhances spectral contrast between successive speech segments. ... [A] fiber adapted by stimulus components close to its CF [characteristic frequency] is less responsive to subsequent stimuli that share spectral components with the adapting sound. On the other hand, stimuli with novel spectral components stimulate 'fresh,' unadapted fibers, thereby producing an enhanced response. (Delgutte 1997:510)}\]
Therefore, interspersing consonants (syllable onsets) between vowels gives the peripheral auditory system time to recover from adaptation, allowing enhanced response for each new vowel (syllable) in the string, as seen in (10).

(10) Neural response to synthesized [ada] (adapted from Delgutte 1997:531)

Adapted from a post-stimulus time histogram for a high-spontaneous nerve fiber (CF=1800 Hz). The stimulus is a synthesized sequence [ada] (with equal intensity in both syllables). The shaded bar indicates the time interval occupied by the CV formant transitions, so its left edge marks the point of consonantal release.

At the time of release into the second [a], this nerve fiber shows some recovery from adaptation. The response rate there, at approximately 500 sp/sec, is larger than the response rate observed where adaptation has set in (i.e., the portion of the neural response to the first [a] that is shown,6 and the response to the second [a] after about 350 ms).

Furthermore, if CV syllables are more prominent than V syllables because the onset consonant provides a contrast to the vowel (thereby allowing the peripheral auditory system time to recover from adaptation), it follows that syllables with low-sonority onsets are even more prominent than syllables with high-sonority onsets. A low-sonority onset such as a voiceless stop is maximally distinct from a vowel, and so would provide the best opportunity for recovery from adaptation.

Thus, there is evidence from neural response patterns that syllables with onsets, and further, those with low-sonority onsets, are prominent. The Prominence Condition, which holds that only prominence-enhancing M/str constraints exist, is therefore consistent with all observed cases of augmentation discussed above.7

5.2. Conceptual justification: the nature of markedness constraints
The Prominence Condition has been motivated by typological patterns, to account

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6 Responses to other stimuli by the same nerve fiber indicate that the initial response rate for the first [a], before adaptation, was probably between 500 and 700 sp/sec (Delgutte 1997:531).
7 This discussion is not intended to propose that markedness constraints make direct reference to neural response patterns, but rather, that the neural response patterns discussed above provide the functional grounding for onset-related M/str constraints. See Silverman (1995) for another application of neural response patterns to phonological markedness.
for why strong positions are never the specific targets of neutralization (by means of $\text{M/str}$ constraints) unless enhancement of prominence is the result. There is also conceptual justification for this kind of restriction.

It has often been observed that there is more than one kind or dimension of markedness. Some markedness constraints, such as those of the $\text{*STRUCTURE}$ family, are ultimately grounded in a “least effort” or “ease of articulation” principle. But another class of markedness constraints calls for the co-occurrence of mutually enhancing properties. For example, Stevens & Keyser (1989) argue that certain feature co-occurrence patterns are marked because they give rise to conflicting cues in the acoustic signal X e.g., prototypical obstruents have no low-frequency energy, because sonorants do; voicing an obstructuent adds low-frequency energy to the signal; so voiced obstruents are marked. Restating Stevens & Keyser's (1989) claim in OT terms, there is a markedness constraint requiring obstruents to be voiceless, because voicelessness makes obstruents more like prototypical obstruents.

The $\text{M/str}$ constraints that satisfy the Prominence Condition, and therefore act to enhance the prominence of strong positions, fall into this second group of markedness constraints. These legitimate $\text{M/str}$ constraints require a strong position, which by definition is already prominent along some phonetic or psycholinguistic dimension, to become even more prototypically prominent by acquiring another kind of prominent characteristic. $\text{M/str}$ constraints that did not act to enhance prominence, such as the putative $\text{M\#V/\#}$, would if anything make strong positions less distinctive by stripping away potential contrasts without adding to the salience of the position.

Thus, $\text{M/str}$ constraints as restricted by the Prominence Condition are conceptually justified in that they belong to an already recognized class of markedness constraints: those that call for mutually enhancing characteristics.

6. Conclusions

Augmentation effects are driven by markedness constraints that are relativized to strong positions. But allowing just any markedness constraint to have an $\text{M/str}$ counterpart wrongly predicts that featural contrasts can be banned from strong positions but preserved in weak positions. In order to account for why only augmentation-driving $\text{M/str}$ constraints occur, this paper has proposed and justified a Prominence Condition on $\text{M/str}$ constraints: $\text{M/str}$ constraints are legitimate only if they act to enhance the prominence of the strong positions that they target. Featural neutralization that does not enhance prominence is thus excluded from singling out strong positions. The Prominence Condition is conceptually plausible, in that markedness constraints often encourage linguistic objects to have prototypical attributes, and requiring a strong position to be augmented makes an intrinsically prominent position become even more prominent.
References


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*The Rutgers Optimality Archive (ROA) is found at <http://ruccs.rutgers.edu/roa.html>.*

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The English GO-(PRT)-AND-VERB construction*

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0. Introduction
This paper deals with expressions of the form [go-(PRT)-and-V], as instantiated by the following examples:

(1) a. I went and bought a weight bench, and don't ever hardly use it.
   b. They don't ever have to go out and get a real job.
   c. Why don't you go ahead and say what you feel, and then I'll respond.

I will analyze the semantics of such expressions on the basis of data from a corpus of spoken American English (Switchboard-1¹). I will also discuss to what extent the patterns underlying examples such as those in (1) should be regarded as instantiating a single construction (in the sense of Fillmore and Kay, e.g. Kay and Fillmore 1999, Goldberg 1995), and to what extent they are better thought of as each instantiating a separate construction. Finally, I will show that these patterns have taken on grammatical meanings to varying degrees, and I will argue that these grammatical meanings emerge from embodied image schemas and culturally grounded discourse contexts.

1. The coordinated-verb construction
The syntactic pattern manifested in the examples in (1) is an instance of what I refer to as the coordinated-verb construction, which in its most abstract form can be structurally defined as follows:

(2) [V₁ intr (PRT) and V₂]

The V₁ in expressions instantiating this construction is typically a motion or position verb, as in We sat and talked all night, Don't just stand there and grin, or Come up and see me sometime. In the patterns discussed in this paper, the PRT is a particle of the kind traditionally referred to as a 'spatial adverb', but note that a PP that tightly collocates with V₁ may also occur in this slot (as in Lakoff's (1986) example What did Harry go to the store and buy?).

* I am grateful to Michel Achard, Hilary Young, and Suzanne Kemmer for commenting on various aspects of this work throughout its inception. Needless to say, they are not responsible for any faults or inconsistencies in my analysis.

¹ All numbered examples in this paper are from this corpus. The examples have been edited for greater readability: pauses, false starts, and repetitions have been removed.
There are several syntactic properties of this pattern that are not predictable from its components or from other constructions in the grammar of English; thus, it qualifies as a construction (Kay and Fillmore 1999, Goldberg 1995). For example, V1 and V2 share the same subject and V2 must have the same tense and aspect as V1. This is not a restriction that follows from canonical coordination. In addition, complements of V2 may be displaced with respect to canonical word order, or more specifically, they may be left isolated (or ‘extracted’), as first noted by Ross (1967 [1986:104f.]). The following examples show this:

(3) a. I just have a problem paying twenty five dollars for a movie that I can *go down and rent* for a dollar.
   b. There used to be wild blackberries that we’d *go out and pick*, my brother and I.

This property is unexpected, given the coordinate-structure constraint generally found with conjoined elements.

The semantic contribution that this construction makes to expressions containing it is that V1 and V2 together are construed as expressing a single event (cf. Lakoff 1986 for a more detailed discussion of a similar proposal, cf. also Josefsson 1991). Evidence for this single-event construal is that any modifiers preceding V1, such as negators and adverbs, will necessarily be interpreted as modifying the whole construction. Moreover, *and* cannot be replaced with *and then* or *at the same time* in this construction without a substantial change in meaning.

As I will show, the V1 in many cases takes on an auxiliary-like function; the event evoked by V2 is construed in accordance with the image-schematic properties (in the sense of Johnson 1987) of V1. For now, note that the single-event interpretation is not predictable, given that typically verb coordination will result in an expression evoking two events as happening simultaneously or sequentially, often suggesting a causal connection (cf. e.g. Lakoff 1971).

2. **The semantics of Go-(PRT)-and-V**

I will now turn to the most frequently occurring instances of [go-(PRT)-and-V], explicating their semantics on the basis of typical examples from the *Switchboard* corpus. In each case I will attempt to capture the most abstract semantic characterization. In doing so, I will necessarily ignore some of the finer distinctions among different uses of each instance, and I will also treat the relations among these different usage types in less detail than they deserve (obviously, a fine-grained radial category analysis of the kind introduced in Lakoff (1987) is possible for every single case).

2.1. **Go-and-V**

Some typical examples of *go-and-V* are given in (4):

(4) a. I was a student for many years, and then [I] graduated and *went and worked* in France for a while.
   b. We *went and saw* ‘Les Miserables’, the music in that was fantastic.
   c. Most of our vacations are to *go and see* Grandma and Grandpa.
   d. I just *went and bought* a Honda, I didn’t even look around or anything.
   e. I’m not interested in keeping big military over there and having to *go and call* the shots like you say.
Example (4a) is the simplest case: go contributes only the expected meaning of 'movement through space' to the utterance. Examples (4b-c) are slightly more complex: here, go-and-V is used to construe typically stative events as dynamic: go and see means something like 'watch' in (4b) and 'visit' in (4c). In example (4d) there is an additional sense of decisiveness, and in (4e) this decisiveness seems to be the only (or at least the principal) contribution of go-and-V to the utterance.

It seems that go in these examples essentially contributes its basic image-schematic property of 'motion along a path', as shown in (5):

(5) Go (The motion schema)

This image-schematic property is blended with the semantics of V2 and renders the latter dynamic either by contributing a component of spatial motion, or by adding or highlighting a dynamic component in the semantics of V2 via the general metaphor ACTION AS MOTION.

The resulting structure go-and-V is a true semantic blend (in Gilles Fauconnier and Mark Turner's sense, cf. e.g. Turner 1996, Fauconnier 1997); it has some semantic properties that follow neither from the meaning of go, nor from that of the respective V2, nor from the coordinated-verb construction, namely that the subject must be animate, and more specifically, acting intentionally: compare the acceptability of Bert/the car went over the cliff and Bert/the car fell over the cliff with the difference in acceptability of Bert/*the car went and fell over the cliff and the unacceptability of *Bert accidentally went and fell over the cliff.

There is a range of non-literal uses of go-and-V which has been observed by traditional grammarians and which can be found in many dictionaries that is based precisely on this constraint. Consider the following examples:

(6) a. (ABOUT STITCHING) Yeah, and I’ve gone and put the needle through my thumb a few times.

b. People that are angry or have concerns or want to seek vengeance have easy access to guns, and in the heat of the moment they can go and do some damage that can hurt themselves and other people.

c. After they’ve gone and done horrible things, molested children and killed them, society has to pay thirty thousand dollars a year to incarcerate them.

d. (ABOUT CONTRACEPTIVES) I’m not going to want to go and have sex with everybody I see. But it’s something you got to think about these days.

In these examples, go-and-V portrays the action described by V2 as "foolish, unreasonable, or unlucky" (Poutsma 1928:562), or as a "surprise or shock, often showing disapproval" (Newbury House, s.v. go and).

This sense of foolishness or disapproval can be explained by the fact that the event evoked by V2 is typically something that happens inadvertently (as in the first two examples), or that is outrageous in a given cultural frame (as in the last two
examples). Essentially, *go-and-V* construes the subject of these expressions as intentional, and it is this intentionality that gives rise to the connotations of foolishness: somebody who intentionally does something that is usually a mishap is foolish and unreasonable. It also accounts for the connotations of shock and disapproval in (6c-d): somebody who intentionally breaks cultural norms is shocking and deserving of disapproval.

In sum, the examples in (6) may at first glance appear to contradict the sense of intentionality postulated for *go-and-V*, but on closer inspection it turns out that they provide additional evidence for it. Thus, although *go-and-V* inherits the properties of the coordinated-verb construction, it has additional properties that are not strictly predictable, and should thus be considered a construction in its own right.

### 2.2. Go-around-and-V

Some typical examples of *go-around-and-V* are given in (7):

(7) a. Around where I live the homeless people all have shopping carts and stuff and they *go around* and *collect* cans and aluminum and stuff.

b. I guess these people that *go around* and *kill* children and women and everything else without any remorse, I don’t think they deserve to live and be supported by us the rest of their lives.

Like *go and*, *go around* may simply contribute a spatial motion component to an utterance (cf. 7a), although often there is a habitual reading involved (cf. 7b). The latter example also shows that *go-around-and-V* inherits the intentionality from the *go-and-V* construction, since it allows the same ‘disapproval’ construal.

*Go around* in these examples contributes the basic image-schematic property of ‘motion along an extended non-directional path’, as represented in (8):

(8) **Go around**

The habitual interpretation in (7b) results from the portrayal of the activity denoted by V2 as such an extended path. Example (7b) also conveys a sense of aimless activity, contributed by the non-directionality of the schema in (8).

There is a similar construction for which this aimlessness is absent: *go-along-and-V*, in examples like *Mark Fuhrman becomes even more relevant in this case as we go along and discuss it* (from the O.J. Simpson trial transcripts). Here, *go along* highlights the extendedness of the path, but it also highlights the fact that the course of events is predetermined, i.e. that the path of action is *directional* to some degree.

In sum, the most abstract characterization we can give to *go-around-and-V* is that it construes an activity as habitual, as well as intentional but aimless. It should be noted, however, that all examples in the corpus allow for a literal motion interpretation in addition to these more abstract meanings.
2.3. **Go-in-and-V**

Some typical examples of *go-in-and-V* are given in (9):

(9)  
- a. *(ABOUT A RESTAURANT)* It would probably take my whole paycheck just to **go in and have** one meal.
- b. We **went in and did** in seven days what Iran couldn't do in seven years.
- c. *(ABOUT B'S BROKEN LEG)*: Did they have to **cast it**?— B: Yeah, they had to **go in and do surgery**. They put a pin in it.
- d. I suspect we should probably have an independent auditing agency **go in and look** at how the government spends money.
- e. I don’t see any problem with outsiders **going in and getting** a little bit involved.

The first two examples are literal uses, which for this pattern constitute the majority of examples in the corpus. Among these literal uses, the most frequent discourse context is that of war or other military operations, which typically leads to a sense of active involvement and commitment. This sense is also present to some degree in (9c-d), which are less literal but can still be interpreted as involving some kind of motion through space. Finally, in (9e) the sense of involvement is all that is left.

The image-schematic properties of *go in* would lead us to expect this reading: the superimposition of a motion schema onto a container schema, shown in (10) yields the meaning ‘motion along a path directed at the center of some bounded space’:

(10) Go in

This may be an actual space (as in 9a-c) or a sphere of interest (cf. 9d) or an already ongoing activity (cf. 9e).

The most general semantic characterization for *go-in-and-V* is that it construed an action as involvement in some preexisting activity, where, due to the container schema, this preexisting activity is construed as outside the subject's expected sphere of responsibility. Although literal motion interpretations are possible for the majority of examples in the corpus, almost a third of the examples are like (9e), with *go-in-and-V* exclusively signaling involvement.

2.4. **Go-out-and-V**

The following are some typical examples of *go-out-and-V*:

(11)  
- a. Now, I understand kids **go out and play** and they get dirty.
- b. *[I'll] have to **go out and buy** a CD player and then start collecting CDs.
- c. I used to **go out and dance** a lot but I don’t do that anymore either.
- d. They always **went out and tried** to draft the best athletes.
- e. Any crime[s] where someone **goes out and premeditatively takes** another life would be the ones where capital punishment would be necessary.
g. (ABOUT WORKING WOMEN) Not to say that women shouldn’t go out and do what they want to do but society’s really going to have to get used to it.

Again, there are literal uses, such as that in (11a), where out simply means outside, but these are the minority in the corpus. More frequent are examples like (11b) where go out can be considered a fixed expression meaning ‘participate in social activities’, or like (11c-d) where it adds the meaning ‘actively engage in the activity denoted by V2’. The last two examples retain only this meaning, with no actual movement necessarily implied. The image-schematic contribution of go out is schematically shown in (12):

(12) Go out

The motion schema is superimposed on a container schema, but with a directionality opposite to that of go in. The meaning contributed by this schema to the utterances in (11) is that it construes some activity in relation to a previous non-activity. In the literal examples this involves going somewhere after staying in one place for a certain period of time, in the non-literal examples it involves realizing a potential not previously realized.

The difference between go-and-V and go-out-and-V is that the former does not highlight the potentiality. This becomes clear when we compare He went and killed someone with He went out and killed someone. Only the second sentence suggests that the subject has planned (or thought about) the act for some time.

It seems that both go-in-and-V and go-out-and-V are more specific instances of go-and-V as far as the literal interpretations are concerned, but that in their abstract uses they are developing additional meanings that make them look more like independent constructions.

2.5. Go-back-and-V

Go-back-and-V clearly differs from the preceding cases in that literal uses are clearly in the minority in the corpus. Two examples of such literal uses are shown in (13):

(13) a. A: And, is your mother still living? — B: Yes. — A: Oh, so you go back and visit with her anyway. Would you not?

b. I’ve always wanted to go back and read some of my literature texts from college, because I enjoyed some of those stories so much.

The basic image-schematic contribution that go back makes is that of motion to some point (in space or time) at which the subject has already been at some earlier time:
The English GO-(PRT)-AND-V construction

(14) Go back

Example (13a) is a literal case, (13b) is an extension to the purely temporal domain on the basis of the metaphor SPACE IS TIME. However, note that a sense of going back in time is also present in (13a), since presumably the addressee lived with her mother at an earlier point in time.

Obviously, it is not possible to actually travel back in time; examples like (13b) express a subjectified return to some earlier point in time. Example (13b) is the simplest case of this, where the subject repeats some earlier action. Typically, however, the meaning of go-back-and-V is more complex than this. Consider the examples in (15):

(15) a. (ABOUT DRUG SCREENING) And if it does come out positive the first time, they need to go back and find out what medications did that person take.

b. (ABOUT TEAM SKILLS) A lot of adults are having to go back and learn those basics when our children are already learning that.

c. A: How do you feel about the Vietnam war? — B: I guess it’s pretty deep feelings, I just went back and rented the movie ‘Good Morning Vietnam’ and got some insight there to help me put together the feelings.

Here, the subjectified motion backwards through time corresponds to repeating an action in more detail based on the outcome of the first pass (cf. (15a)); making up for some earlier non-activity (cf. (15b)); or simply relating a present activity to a past event (cf. (15c), where the speaker has never seen the movie in question before).

The most abstract semantic characterization of go-back-and-V is that it construes an action as relevant to some past action or experience. Thus, although the non-literal uses shown above are motivated by the metaphor TIME IS SPACE, their meanings are more specific than anything that would be predictable from the way this metaphor generally functions in English.

Thus, go-back-and-V must be considered a separate construction. Contrast this with go-around-and-V and go-along-and-V, which are plausibly regarded as more specific instantiations of the general go-and-V construction, and go-in-and-V and go-out-and-V, which seem to be halfway between being instances of go-and-V and being constructions in their own right. Further evidence for the independent status of go-back-and-V is the fact that the intentionality constraint on the subject is absent: note that there are no examples expressing foolishness or disapproval, and note also the acceptability of the (constructed) utterance I videotaped the Super Bowl, but then I accidentally went back and erased it.

2.6. Go-ahead-and-V

The last case discussed here is go-ahead-and-V. This case differs from all others in that the corpus does not contain a single example expressing literal motion, and that it is almost impossible to construct such examples. Instead, this construction has
three main meanings: (i) permission or enablement, (ii) choosing one path of action among several possible paths, and (iii) pursuing a path of action in spite of possible obstacles.

First, consider the following examples:

(16) a. A: Okay. You want to *go ahead and start*? — B: Uh, I was hoping that you would but, oh... — A: Oh.

b. *(ABOUT S. HUSSEIN)* Well, do you think that we should ignore it and just allow him to *go ahead and, you know, move* on into Kuwait?

In example (16a) the speakers are negotiating the start of a discussion: speaker A is giving speaker B permission to take the first turn. Example (16b) is similar in that the issue here is whether the US should permit Hussein to move into Kuwait.

The second type of context is shown in (17):

(17) a. And we’re going to *go ahead and try* to just live on what we earn instead of guessing ahead of what we probably will have next month.

b. Do you just brown the chicken to get it colored or do you *go ahead and let it cook* through?

Here, the activity encoded by V2 is contrasted with some alternative path of action.

Finally, the third type of context is shown in (18):

(18) a. I’m Catholic and we’re not supposed to, but I feel that if it’s beyond a doubt that you did it, you know, I would say *go ahead and execute* that person as well.

b. It’s never been clear to me how Congressmen can just sort of *go ahead and vote* their own conscience as their own ideas when clearly their constituency doesn’t back them up on anything.

c. I had ordered a sofa and had filled out the paperwork, but they weren’t supposed to process it until they delivered it. And I changed my mind, but then they *went ahead and charged* it on my account.

Here, the activity encoded by V2 is portrayed as occurring in spite of some potential obstacle: the belief system of the speaker in (18a), the lack of support from the constituency in (18b), and the fact that the speaker had changed her mind in (18c).

These three uses of *go-ahead-and-V* can be unified by stipulating that its most abstract semantic function is to construe an action in relation to some potential obstacle, which may be a lack of permission, a motivation to act in a different way, or an alternative path of events. In any case, the existence of an obstacle makes the event encoded by V2 less expected than some alternative path of action. The basic image-schematic contribution of *go ahead* is shown in (19):

(19) \[ \text{Go ahead} \]

\[ \begin{array}{c}
\text{\textbullet} \\
\text{\textbullet} \\
\text{\textbullet} \\
\text{\textbullet} \\
\text{\textbullet} \\
\end{array} \]

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The English GO-(PRT)-AND-V construction

The motion schema encoded by go is superimposed on an obstacle, which is
generated by the path of motion (encoded by ahead). This obstacle, whatever its
nature, is implied by go-ahead-and-V itself, i.e. it does not have to be explicitly
coded. Consider examples (20a-b):

(20) a. A: Well, I need to go ahead and wrap it up. — B: Okay. — A: Um, it
was really nice talking to you. — B: Well, I’ve enjoyed it, Stephanie.
b. (ABOUT THE MOVIE FLATLINERS) They would go ahead and kill
themselves for three or four minutes to see what happens.

In both these examples, there are implicit obstacles. In (20a) speaker A assumes that
bringing the conversation to a close at this particular point is unexpected from
speaker B’s perspective: since you cannot terminate a conversation unexpectedly
(cf. e.g. Levinson 1983:316f.), this is a potential obstacle.

In (20b) the speaker is talking about a movie in which a group of interns kill and
then at the last possible moment revive each other in order to find out what happens
after death. Obviously, there are many good reasons (and hence potential obstacles)
for not taking that risk.

There is a related construction which shares with go-ahead-and-V the sense of
proceeding, but which does not focus on potential obstacles, and hence does not
imply unexpectedness. This is go-on-and-V, exemplified in (21):

(21) a. My husband and I went through college together and then he went on
and got his Master’s degree while I was working.
b. (ABOUT A POLITICIAN) He is saying, I am going to give you this ludicrous
little tax cut so that you’ll be happy come November, and you’ll elect me
again, and then I’m going to go on and just forget everything that I said.

The image-schematic structure evoked by the dynamic meaning of on contributes
the forward-directedness also found with ahead, but it does not make reference to an
(explicit or implicit) obstacle.

Although go-ahead-and-V is fully motivated by the go-and-V construction and
the expression go ahead (as in May I use your pencil?—Sure, go ahead) it must be
regarded as a separate construction, since there is a constraint that is not predictable
from either of these: as mentioned, it can not be interpreted literally. Even where a
literal reading is strongly encouraged by the context, it is dispreferred. A sentence
like The others stayed behind while we went ahead and made coffee is almost
impossible to interpret as spatial movement on the part of the speaker, but note that
no such restriction exists with ...while we went ahead TO make coffee.

2.7. Some other go-PRT combinations
In addition to the go-PRT combinations discussed above, there are many other such
combinations that occur only with a literal (i.e. spatial) meaning in the corpus, for
example go away and, go by and, go down and, go forward and, go through and,
and go up and. Note that these are nevertheless instances of the go-and-V
construction, since they all allow extraction, they all express single events, and they
all require an intentionally acting agent.
3. Summary and discussion

The preceding section has discussed a family of constructions instantiating the coordinated-verb construction. All these constructions have in common the fact that V1 is go, and can thus be captured by the abstract characterization in (22):

(22) \[\text{go-(PRT)-and-V}\]

The abstract uses that the different instantiations of (22) develop are very ‘grammatical’ in meaning, expressing notions encoded by various types of verb-phrase operators in many different languages: they modify the internal temporal shape of the event encoded by V2, they ground it in space, they signal expectedness or speaker evaluation. The function of these constructions is thus comparable to notions like aspect, locational and directional marking, and mirativity.

Summarizing the analyses presented in the preceding section from this perspective, we can characterize the constructions as follows: go-and-V construes an event as dynamic, and it tends to express negative evaluation; go-in-and-V and go-out-and-V are clearly directional (as are all the constructions to some degree, except go-ahead-and-V), and they also express something like inceptive aspect; go-around-and-V construes the event encoded by V2 as habitual, and, like go-and-V it imparts negative evaluation; go-along-and-V expresses a progressive or conative construal; go-ahead-and-V often signals unexpectedness as well as inceptiveness, and go-on-and-V signals only inceptiveness. The meaning of go-back-and-V is difficult to characterize in terms of traditional grammatical notions. Michel Achard (p.c.) has pointed out that in its more abstract uses it is, in essence, a ‘redemption construction’: it construes the event encoded by V2 as making up for a past failing of some sort. Thus, we might add to the list of traditionally recognized aspectual meanings, and say that go-back-and-V encodes ‘redemptive aspect’.

In this paper I have argued that in its simplest form without a PRT, [go-(PRT)-
and-V] is a construction, and that those cases where the PRT is around, in, or out are more specific instantiations of this construction, with the latter two moving toward becoming independent constructions. They all inherit from the coordinated-verb construction the construal of V1 and V2 as a single event, and they all inherit from the go-and-V construction the requirement that the subject be acting intentionally. I also argued that go-ahead-and-V and go-back-and-V are different from the other cases: they are constructions in their own right, since both have properties that go beyond anything strictly predictable. At least the latter does not require an intentionally acting subject, and both of them are typically interpreted non-literally (in fact, the former cannot be interpreted literally at all). Instead, their typical functions are to signal the abstract meanings mentioned above (‘unexpectedness’ and ‘relevance to a past activity’ respectively).

In closing, I will briefly discuss where the specific semantic properties of the constructions discussed here come from. Consider the table in (23), which shows the frequencies (in Switchboard) of the literal and non-literally uses of each of the patterns discussed in the preceding section (the uses with more abstract connotations in addition to their literal interpretation are categorized as literal here):
The English GO-(PRT)-AND-V construction

(23) Frequency of literal and abstract uses of [go-(PRT)-and-V]

<table>
<thead>
<tr>
<th></th>
<th>LITERAL</th>
<th>ABSTRACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(bare)</td>
<td>100 (75%)</td>
<td>34 (25%)</td>
</tr>
<tr>
<td>around</td>
<td>12 (100%)</td>
<td>— (0%)</td>
</tr>
<tr>
<td>out</td>
<td>164 (94%)</td>
<td>11 (6%)</td>
</tr>
<tr>
<td>in</td>
<td>33 (69%)</td>
<td>15 (31%)</td>
</tr>
<tr>
<td>back</td>
<td>14 (33%)</td>
<td>28 (67%)</td>
</tr>
<tr>
<td>ahead</td>
<td>— (0%)</td>
<td>98 (100%)</td>
</tr>
</tbody>
</table>

The increasing number of purely abstract uses as we move down the table is clearly suggestive of an increasing degree of grammaticization. It is interesting to point out that the acquisition of specific grammatical meanings (which may then gradually replace the original meanings) occurs within a pattern that is already functioning as a construction (recall that even the fully literal uses have formal properties that single them out as such). Thus, the gradual bleaching of the original meaning and the development of more abstract functions occurs for a complex construction rather than for individual morphemes.

The emerging grammatical meanings or functions are not arbitrary; they are motivated in two ways. First, at a general level, they are motivated by the image-schematic structure of the go-PRT combination in question. The meanings are thus embodied, in the sense of this term postulated by George Lakoff and Mark Johnson in many publications, e.g. Lakoff 1987, Johnson 1987). Second, and just as importantly, the specific direction in which the additional meanings develop emerges from frequent discourse contexts instantiating the image-schematic structures (this is emergence in Paul Hopper's sense, cf. e.g. Hopper 1998). The content of these discourse contexts is clearly culture-specific (recall, for example, the military connotations of go-in-and-V). Thus, the emergent meanings are also culturally and socially grounded.

References


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The Korean modal marker *keyss* revisited: A marker of achieved state of intersubjectivity

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0. Introduction

In previous research, the Korean modal marker *keyss* has been extensively studied as a marker of the speaker’s epistemic judgment, and focus has been given to identifying the source of evidence or determining the degree of certainty, i.e., the likelihood of occurrence of an event (J.-S. Suh 1978, K.-C. Sung 1979). In this paper, we hope to propose an analysis of *keyss* that complements this ‘epistemically-oriented’ line of analysis and examine its functions from an ‘interactionally-oriented’ perspective (cf. J. Ree 1995). From a conversation-analytic perspective (Sacks, Schegloff & Jefferson 1974), this study analyzes *keyss* as a marker of an achieved state of intersubjectivity, drawing upon a previous analysis of *kyess* as a marker of the speaker’s ‘involving stance’ (cf. Gee & Savasir 1985, K.-H. Suh & K.-H. Kim 1991).

The modal functions of *keyss* can be categorized under the two semantic types of modality: (i) speaker-oriented modality marking the speaker’s intention and (ii) epistemic modality expressing the speaker’s epistemic judgment of and commitment to the truth of a proposition. The first type of *keyss* is used with the first person subject and an action verb, as in example (1) below. The second type of *keyss* yields a number of different messages depending on the nature of the verb and the subject person. A case in point is example (2):

(1) *ka-po-keyss-supnita.*  
“*I’ll now go.*”

(2) *coh-keyss-ney-yo*  
“You/He must be happy.”

Many previous studies analyze *keyss* by comparing it with another epistemic modal marker with a similar meaning, *(u)lkes* (or its simplified form *(u)lke*). They suggest that *kyess* is used when the source of information is subjective whereas *(u)lkes* is used when the evidence is objective (C. Suh 1978). C. Suh’s analysis is criticized by K. Sung (1978) on the grounds that the basis for judgment or
deduction is inherently subjective. Sung suggests that the function of keyss should be understood in terms of the source of evidence. He argues that the source of evidence for the keyss-utterance lies in the speaker’s current experience, while the source of evidence for (u)likes tends to be based on the speaker’s past experience.\footnote{In a similar vein, J. Ree (1995) suggests that keyss is associated with the speaker’s new experience/unfamiliarity with a particular discourse situation.}

In a similar vein, K. Chang (1984) proposes that keyss is used to mark an ‘outcome’ from a certain ‘source’ which is retrievable from the discourse context or which exists in the speaker’s mind.

In this paper, these previous observations, which focus on the speaker’s inner state and subjective experience, are recast in an interactional light and related to the function of keyss evoking the interactants’ interpersonal commitment toward achieving shared understanding. What is marked by keyss is proposed as being associated with the speaker’s (and hearer’s) collaborative move to formulate an event as an intersubjectively shared experience that has significant sequential implications for the following discourse contexts.

The approach we are taking in this paper is a conversation-analytic approach (Sacks, Schegloff & Jefferson 1974). Following up on our previous research, where we analyzed keyss as a stance-marker indexing interpersonal involvement between the speaker and the hearer, we will examine various uses of keyss in terms of the kind of action constituted by the keyss-utterance and the sequential implicativeness in the subsequent context as well as its orientation toward the preceding context. From the participants’ perspective as displayed by the sequential development of conversation, the interactional function of keyss is analyzed with reference to its context-shaped aspect, i.e., in terms of how keyss utterances are used in response to the preceding context, and to its context-renewing aspect, i.e., in terms of how they shape the subsequent context (Heritage 1984). The analysis of these sequential aspects is an inquiry into the procedures interlocutors use and rely on to interpret the other’s utterance and design their contribution to the interaction in-progress (Heritage 1984: 242).

The data analyzed in this paper include audiotaped telephone conversations (P & S and Military Generals). P & S is a conversation between a professor (the second author of this paper) and his student. Military Generals is a conversation between military officers.\footnote{This conversation is part of a set of conversations between military generals recorded surreptitiously by the Korea Central Intelligence Agency during the 1979 military coup d’etat in Korea.} Also included in the data is a segment from a telephone conversation which was written down on the basis of memory immediately following the conversation (F & S).

1. **Joint attention as ground for judgment and action**

As a marker of epistemic judgment, keyss is used for formulating the speaker’s deduction or judgment on the basis of some evidence (K. Chang 1984, H. Lee 1991). Consider example (3), where the speaker produces the keyss-utterance...
while observing some dark clouds in the sky:³

(3)  

\textit{pi o-keyss-ta.}  \hfill "It looks like rain." (Noticing some dark clouds in the sky))

One important observation that we can make about example (3) would be that the use of \textit{kyess}-utterance in predicting weather conditions is warranted by the fact that the speaker has led the hearer to notice the dark clouds and share the evidence with him/her. The upshot of the utterance lies in leading the hearer to accept the speaker’s judgment (i.e., “It looks like rain.”) on the basis of the hearer’s co-orientation to the shared evidence thereof (i.e., dark clouds) and in engaging the hearer in some subsequent action.

This interactive process evoked by \textit{keyss} provides a solid intersubjective ground on which a subsequent action can be initiated as a next action relevant to the participants. For instance, in example (3), the \textit{keyss}-utterance may initiate a subsequent joint action such as finding a shelter, canceling plans to go on a picnic, or producing small talk about weather. That the speaker’s judgment is formulated as being based on something that can be easily shared by the hearer increases the likelihood that a collaborative uptake will follow.

In some contexts, what is noticed by the speaker as the source of his/her judgment is the information provided by the interlocutor in the immediately preceding context. Consider example (4), which shows a segment of a telephone conversation between father (F) and son (S):⁴

(4) (F & S)

<table>
<thead>
<tr>
<th></th>
<th>F:</th>
<th>sensayngnim myet si -ey o -a. teacher what time-LOC come-IE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>S:</td>
<td>twu si. two o’clock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>((about two lines omitted))</td>
</tr>
<tr>
<td>5</td>
<td>F:</td>
<td>ung ku -tay-kkaci cwunpi com hay-ya -toy -keyss-ney::: yes that-time-until preparation a little do -OBL-become-MOD-</td>
</tr>
<tr>
<td></td>
<td>FR</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S:</td>
<td>ung. kulay -ya -ci. yes do like that-OBL-COMM</td>
</tr>
</tbody>
</table>

[English version]

1  F:  "What time is your tutor coming?"
2  S:  "Two o’clock."

---

³ Note that (u)lkes, the competing form of \textit{keyss}, cannot be used in this context. As we will discuss below, (u)lkes tends to mark the judgment as based on the speaker’s own knowledge not shared by the hearer.
⁴ Each of the conversational segments is followed by a rough English translation. The transcription notation used for this paper was adapted from Atkinson & Heritage (1984) and Sacks, Schegloff & Jefferson (1974).
As the son tells his father that his tutor will come at two, the father produces a *keyss*-utterance in line 5, by which he suggests that the son should prepare for his lesson. Here what the father does with the *keyss*-utterance is to show that he has incorporated the information provided by his son as the evidential basis of the judgment he makes ‘on the spot’. In this way, he shows that the information about the tutor’s arrival time is now shared between them through his collaborative act of ‘noticing’ the information and using it as a basis of his judgment.

Note that the use of *keyss* provides the father with a solid ground for formulating his judgment as an indirect way of ‘giving a directive’ to his son, i.e., as a prompt leading him to study. This would be a very efficient way of giving a directive because, since the father formulates his judgment on the basis of an apparently shared source of information, his judgment is likely to be accepted by the son. In this sense, *keyss* enables the father to give the directive from a ‘shared’ perspective, and not surprisingly, the son accepts it (line 6).

On the basis of these observations, the epistemic function of *keyss* can be accounted for as follows. First, *keyss*-marked judgment displays the speaker’s presuppositional endorsement of a fully shared source of information provided in the immediate context. Second, *keyss*, by virtue of marking the speaker’s judgment as being based on some shared source of information, evokes an interactive process in which the hearer’s attention is intensely drawn to the speaker’s judgment and/or its source of information. Third, with the source of information being shared, and with the speaker’s judgment grounded on the shared understanding, the speaker solicits and achieves the hearer’s uptake of the action being constituted by his *keyss*-marked utterance. The formulation of the speaker’s judgment as a shared one, or as something that can be reasonably shared by the hearer, offers the speaker the means to initiate an action *from the hearer’s (or a shared) perspective* and solicit a collaborative uptake. The ‘presuppositional’ sense of intersubjectivity initially indexed by *keyss* is thus procedurally fulfilled and interactively constructed as an ‘achieved’ state of intersubjectivity by the hearer’s immediate co-orientational move and collaborative uptake.

---

5 While the hearer’s response is likely to be a collaborative one, it may problematize the speaker’s judgment or its source of information. Either in agreement or in disagreement, its responsive force is likely to be intense by virtue of the fact that the speaker of *keyss* has presuppositionally asserted that his/her judgment and/or its source of information is something to be agreed to and shared by the hearer. In general, we can say that there are three aspects of the use of *keyss* to which the hearer may be oriented as a target domain to deal with subsequently: the speaker’s judgment, its source of information, or the action upshot of the *keyss*-utterance, i.e., the subsequent action that it initiates.
The Korean modal marker keyss revisited

These interactional features of keyss are also observed in example (5). In this telephone conversation, the participants (a student, S, and her professor, P) are deciding on the most convenient time for S to visit P’s office. Keyss-utterances are found in lines 36, 46, and 48. These keyss-utterances are produced while P and S are considering several options in the course of setting the appointment time:

(5) (P & S)

30 P: *ah (.) uh:: ama sipi il -un com (kuleh -ta)*
DM probably twelve day-TOP a little like that-DECL
31 sipsam ilnal nay-ka mikwuk ka-ketun,
thirteen day I-NOM U.S. go-INFORM
((several lines omitted))

→ 36 S: e:::ng. *hhh kulem pappu-si -keyss -kwun-a::*
yes then busy -HONOR-MOD-IR -IE
37 kulemyen sipkwi il -ccum::;
then nineteen day-around
38 P: kulehkey ha-lkka?
like that do-SUGG
((several lines omitted))

45 S: *hhh em:: ( ) mwe ku cen -ey mwe*
DM what that before-LOC what

→ 46 *mili yenlak-ul mos tuli -keyss -ney-yo,*
in advance call -ACC not able give-MOD-FR-POL
47 kyoswnim-i an kyesi-nikka,
professor -NOM NEG exist-REASON

→ 48 P: *e ku -ttay -n kule -keyss -kwun-a ko cwu -nun*
DM that-time-TOP like that-MOD-IR -IE that week-TOP
49 *ko cwu -nun.*
that week-TOP
50 S: kulemyen-un assali samwel isip il il -ccum -ey::,
then -TOP completely three month twenty one day-around-
LOC

[English version]

30-31 P: “Oh, uh:: I don’t think the 12th is the right time, because I’m going to the U.S. on the 13th."
((several lines omitted))

→ 36-37 S: “I see. *hhh Then you’ll probably be busy.* Then, how about sometime around the 19th?”
38 P: “Shall we meet that day, then?”
((several lines omitted))

→ 43-47 S: “I probably won’t be able to reach you before then since you’ll be out of the country.”
48-49 P: “Oh yeah, you’re probably right. You probably won’t be able to contact me that week.”

50-51 S: “Then how about this. Around March 21st…”

In the context preceding this fragment, the student proposed the 12th as a candidate day of appointment, but in lines 30 and 31, the professor says that that day is not such a good time because he is scheduled to leave for the U.S. the next day. On the basis of this remark, S, in line 36, produces a keyss-utterance by which she expresses her inference that he may be busy on that day and not available for appointment (“You’ll probably be busy.”).

It is important to note here that what keyss indexes in line 36 is the sense in which S has ‘noticed’ and formulated P’s schedule presented in the immediately preceding context as the shared focus of joint attention and as the basis of her judgment. By doing so, S displays that she has made her judgment on the basis of her intersubjectively shared understanding of P’s schedule, thus expressing a highly collaborative and empathetic attitude toward P.

As in example (4), it is important to point out that this co-orientational shift marked by keyss serves to provide a common ground for the participants to engage in a subsequent action. Note that S’s keyss-utterances in lines 36 and 46 provide a ground for the joint action of ‘withdrawing’ the proposal made earlier; S uses keyss as she withdraws the proposal she has made on the basis of the shared understanding of P’s itinerary. We also find that P uses keyss in line 48 to affirm S’s judgment and, by doing so, formulates the withdrawing of the prior proposal as a joint, collaborative act. These utterances mark the boundary at which the participants discard an option and proceed to consider another on the basis of mutual agreement.

It should be noted in passing that keyss is frequently used with sentence-final modal particles such as -kwun (a marker of inference-based realization) or -ney (a marker of factual realization), as shown in lines 36, 46, and 48 in example (5) and in line 5 in example (4). The particle -kwun is used for marking the proposition as the inference that the speaker has newly made (Lee 1991), and the particle -ney for marking the proposition as the information that the speaker has realized on the basis of some factual evidence (Lee 1991, Choi 1995). Note that these sentence-ending particles are not compatible with (u)likes, the competing modal form of keyss:

(6) pappu-si-keyss-kwun-a /*-like-kwun-a. “Then, you’ll probably be busy.”

(7) mili yenlak-ul mos tuli-keyss-ney-yo /*-like-ney-yo, “I probably won’t be able to reach you before then”

As for (u)likes, there is no sense of sharedness. The source of information for (u)likes exclusively belongs to the integral part of the speaker’s own knowledge, and hence is not compatible with modal particles like -kwun and -ney. The fact that -kwun or -ney is compatible with keyss, therefore, supports the observation
that the source of evidence for keyss lies in the immediately preceding context and
is immediately perceived on the spot as the source of judgment.

2. Enactment function of keyss
As we have noted in examples (4) and (5), the display of an achieved state of co-
orientation and joint attention tends to provide a basis for soliciting a collaborative uptake from the hearer in the context of involving the hearer in the current action. In this respect, the hearer is often sequentially invited to make an interpersonal commitment and collaborative adjustment to the action constituted by the keyss-marked utterance. Consider an imaginary situation where the participants are in a hurry to leave:

(8) nuc-keyss-ta. “We’ll be late.” ((hurrying up))

By using keyss, the speaker establishes their current situation as the focus of joint attention and on the basis of this shared ground presents his/her epistemic judgment that they may be late. Note that the action constituted by this keyss-utterance is an indirect form of suggestion or a ‘warning’, which is likely to solicit some kind of uptake from the hearer. From the shared perspective, the hearer, for example, is invited to make an orientational shift or readjustment toward terminating whatever he/she is doing at the moment or toward finding another means of reaching their destination on time. If we use (u)lkes instead of keyss here, such an enactment function will be lost, and there will be no sense of the hearer being invited to make some responsive action. Formulated with (u)lkes, the utterance would turn into an information-giving statement, which does not evoke any immediate action.

Such an enactment function of keyss is saliently observed where keyss marks speaker-oriented modality. Imagine a situation where a pastor says the following to the congregation during a church service:

(9) kito-ha-si-keyss-supnita. “You will pray. (= Let’s pray.)” ((getting ready to pray))

In (9), the keyss-utterance performs a special type of ‘announcement’ action, which evokes interpersonal commitment for the hearers to make a collaborative adjustment to the action being initiated by the speaker. For example, this keyss-utterance will be followed by the participants’ subsequent action of joining the pastor in prayer, taking the praying posture and getting themselves ready to pray. In this sense, the speaker of keyss is making an announcement to which a prompt adjustment and display of co-orientation is sequentially evoked on the part of the hearers (Suh & Kim 1995).  

6 As the English translations of these keyss-utterances suggest, keyss as a speaker-oriented modal marking the speaker’s intention to act displays features similar to those of will in English, which,
3. **keyss as acknowledgment marker**

On the basis of the preceding analysis of *keyss*, we will move on to examine a context in which *keyss*-utterances are used as an acknowledgment marker displaying the speaker’s commitment to undertaking a particular action. Consider example (10), which shows a segment of a wired telephone conversation in which A, a military general, is receiving orders from his superior officer, B. In line 2, A uses *keyss* with an action verb (“I will do as you have directed.”) in acknowledging B’s order. In line 54, he uses *keyss* with the verb of cognition *al-ta* ‘to know’ in acknowledging B’s order (“I understand.”). In line 56, *keyss* is also used as the speaker initiates the closing of the conversation in earnest, conveying the meaning “I will hang up now.”:

(10) (Military Generals)

((B has been giving a series of orders to A.))

1 B: *tasi hanpen hwakin -ul hay-cwu-sey -yo.*
   again once confirmation-ACC do -give -HONOR-POL

→ 2 A: *kulehkey ha-keyss-supnita.*
   like that do -MOD-FPOL

((about 50 lines omitted))

53 B: *nay mal  kaciko-to an toy -pnita.*
   my language with -also NEG become-FPOL

→ 54 A: *al -keyss-supnita.*
   know-MOD-FPOL

55 B: *ko -kes-man hwakin -hay-cwu-sey -yo.*
   that-thing-only confirmation-do -give-HONOR-POL

→ 56 A: *tul -e -ka-keyss-supnita.*
   go in-CONN-go-MOD-FPOL

57 B: *O.K.*

58 A: *tul -e -ka-si -psio.*
   go in-CONN-go-HONOR-FPROP

59 B: *Thank you.*

60 A: *yey.*
   Yes

[English version]

((B has been giving a series of orders to A.))

1 B: “Please confirm it one more time.”

→ 2 A: “**I will do as you have directed.**”

as Gee & Savasir (1985) aptly observe, are associated with the activity type of ‘undertaking’. It should be noted that this type of *keyss*-utterance indexes a high degree of formality and politeness. This would be attributable to the interactive process in which the speaker displays a collaborative orientation toward complying with the hearer and/or soliciting the hearer’s interpersonally committed permission to allow him/her to initiate the action (see discussion below).
The Korean modal marker keyss revisited

((about 50 lines omitted))

53 B: "You can’t override it, not even with my order."

→ 54 A: "I understand."

55 B: "Please make sure that you confirm the order no matter what."

→ 56 A: "I’ll go in (=I’ll hang up now)."

57 B: "O.K."

58 A: "Please go in (=Please hang up now)."

59 B: "Thank you."

60 A: "Yes."

In these keyss-utterances, A acknowledges B’s order and shows his intention to undertake the order as directed. By using keyss, the speaker shows that his intention to act or his cognitive shift is the outcome of his collaborative adjustment to the interlocutor’s order in the preceding context. The interlocutor’s order is ‘affirmed’ as the source of his new realization and his subsequent action.

This explains why keyss-utterances are often used as ‘compliance’ to commands. Here keyss goes beyond marking the receipt of the information and presents the speaker’s collaborative intention as a ‘reassurance’. Just like other keyss utterances we have examined above, these keyss-utterances furnish the participants with the common ground on which the participants intersubjectively affirm the receipt of the order and proceed to address themselves to the next order.

The use of keyss with such cognitive verbs as ‘know’ or ‘don’t know’, as in “I understand.” or “I don’t understand.”, is often perceived as a puzzle to learners of Korean as a foreign language. Actually, there does not seem to be any plausible motivation to use keyss when the speaker shows that he has understood the other’s point. Consider example (11), which reintroduces lines 53 and 54 in example (10). Here keyss is compared with (u)ikes, and also with the perfective particle ass (al-ass-supnita. “I understand.”), which is often used as an acknowledgment marker in conversation:

(11) B: nay mal kaciko-to an toy-pnita. “You can’t override it, not even with my order.”


First note that the use of (u)ikes in this context is out. As a marker of the information belonging to the speaker’s exclusive knowledge, it is not compatible with the context where the speaker acknowledges the information provided by the interlocutor.

The perfective ass-utterance could be used here instead of keyss. However, the ass-utterance simply registers the fact that the speaker has received a piece of information from the interlocutor and understood it. What is missing in the ass-utterance is the speaker’s displayed adjustment of the cognitive state and collaborative orientation toward the interlocutor’s order. Compared with the keyss-utterance, the ass-utterance only marks the receipt of the information,
lacking the sense in which the speaker is interpersonally committed to undertaking the action as directed. It may be for this reason that the keyss-utterance is viewed as a more polite expression than the ass-utterance.

Now it is important to note that the keyss-utterance in line 54 in example (10) is used as a pre-closing signal, which leads to the initiation of the closing segment of the telephone conversation. As Schegloff and Sacks (1973) observe, the function of a pre-closing signal is to show that the speaker has nothing more to say. By doing so, the speaker provides the hearer with the opportunity to agree to close the conversation or to bring up hitherto ‘unmentioned mentionables’, i.e., whatever the hearer has not had a chance to talk about. Note that A’s keyss-marked pre-closing signal in line 54 does not lead the conversation to a close but is followed by B’s repeated order and further reminder produced as an unmentioned mentionable on B’s part. In this respect, note in line 56 that A produces another keyss-utterance as a pre-closing signal that the closing is imminent. This keyss-utterance, which has the literal meaning of “I’ll go in.”, is a particular type of formulaic expression signaling the speaker’s intention to hang up. Note that this utterance does lead to the terminal exchanges (lines 57-60).

Given our description of the function of keyss, a keyss-utterance would be a nice candidate for a pre-closing signal, because, by using keyss, the speaker can express his negotiable intention to terminate the call and invite the hearer to establish the act of terminating the conversation as a joint action. In this case, the subsequent action which keyss provides the basis for would be ‘terminating the conversation’.

4. Conclusions

The analysis of keyss we have presented here touches on an important aspect of the ways in which expressions of modality are inherently associated with the organization of discourse contexts. Keyss, either as a speaker-oriented modal or as an epistemic modal, has the sequential function of showing the listener that a state of intersubjectivity has been or is to be achieved on the spot. Various interactional and sequential functions of keyss can be taken as deriving from the participants’ collaborative adjustment and interpersonal commitment toward affirming such a state retroactively or prospectively.

It is important to note, in this respect, that the upshot of the keyss-utterance as an epistemic modal is not found in providing the speaker’s judgment per se, but in providing the common ground for the hearer to share the speaker’s judgment and its source of information as a basis for executing some action (or joint action) from a shared perspective. The kinds of action thus constituted will vary according to the context, which include such actions as displaying empathy, giving a directive, making a suggestion, giving a warning, teasing, joking, offering, etc. The interactional basis for these actions is provided by keyss evoking a sequential commitment of the hearer toward accepting the speaker’s judgment whose source of information lies in some situational or emotional aspects noticeable and shareable by the hearer.
The Korean modal marker keyss revisited

The state of achieved intersubjectivity and shared ground indexed by a keyss-utterance could be variably presented and dealt with by the interlocutors. While it is often affirmed and collaboratively responded to by the hearer, it may be contested or rejected. In either case, keyss evokes the pressure toward co-orientation and joint attention by virtue of indexing the speaker’s strong intersubjective expectation of a collaborative uptake (e.g., a display of strong empathy) and thus often invites an affectively intensive response (e.g., wholehearted support/approval, inquisitive repair-initiator, or a firm denial). This feature makes keyss a resourceful means of making comments and generating topics in a highly interactive fashion. In the process, the hearer is involved as a partner whose solicited contribution to the current action makes the action a mutually affirmed one impinging upon both parties (cf. Gee 1985, Gee & Savasir 1985). Explicating these various kinds of specific actions performed by keyss and their sequential configurations would be an interesting research topic for a follow-up study.

References

Suh, K.-H. and K.-H. Kim. 1991. The Korean modal markers keyss and (u)lkes:


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Relation between gaze, head nodding and *aizuti* 'back channel' at a Japanese company meeting

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1. Introduction
Building on research on gaze (Kendon 1990, C. Goodwin 1981, M. Goodwin to appear), Japanese *aizuti* 'back channel utterances' and head nodding (Maynard 1986, 1987, 1989; Sugito 1987, 1989), and participant roles (Sztadowski 1993, 1997, 2000), I will investigate the relation between gaze, head nodding and *aizuti* at a Japanese company meeting. The data for this study come from a 2-hour orientation meeting for a new female employee at a Japanese company. In particular, I will focus on the interrelation between gaze, head nodding and *aizuti* in sections where this female employee is the addressed recipient of information presented at the meeting.

2. Prior Research
Although American native English speaking students of Japanese look at their native Japanese speakers in silence, giving them their full attention, they are often viewed as inattentive and overbearing by native Japanese speakers, and in some cases may even give Japanese native speakers the impression that they do not understand. Similarly, many an English speaker invited to give an academic lecture in Japan is surprised to look out at his/her Japanese audience and find that nobody is looking in his/her direction. He/she is equally surprised to be asked many intelligent questions after the lecture is over, despite this apparent lack of attention. Japanese businessmen faced with the silent and rapt attentive gaze of their English interlocutors, may nod their heads almost twice as much as they would in normal Japanese conversations. This wins them the reputation of being what Yamada (1997) refers to as "insincere agreeers" because they often disagree, after they have been nodding and saying "Yes" frequently while listening to the American English speaker's talk.

1 I would like to thank Kyoko Suzuki for her help in collecting and transcribing the data used in this study, Professors Kiyoshi Egawa (The National Language Research Institute, Tokyo) and D.A. Andow (The University of Minnesota) for their advice on statistics, and Takahiko Ogata for his help with the video framegrab used in this paper. I am also deeply grateful to the participants, who will remain anonymous, for allowing me to use their meeting as data for this study.
These anecdotes are examples of what Gumperz (1977, 1982) refers to as cross-talk (cross-cultural misunderstanding), which is often caused by the misinterpretation of metamessages which are triggered by contextualization cues, e.g., prosody, posture/kinesic behaviors, formulaic speech and routines, etc. When speaking Japanese, native English speakers can appear inattentive, overbearing or unable to understand Japanese because they fail to punctuate their native Japanese speakers' utterances with head nods and aizuti (e.g., Hai 'Yes', Un 'Uh huh', etc.), and also because they gaze directly at the speaker. Despite the fact that the use of aizuti and head nods by both speakers and listeners is crucial for the maintenance of successful interaction in Japanese conversation, aizuti and head nods have been given little attention in Japanese textbooks. Several studies have shown that Japanese speakers nod and give aizuti at a much higher frequency and with a wider variety of functions than English speakers do.

Research on gaze in English interaction by Kendon (1990), C. Goodwin (1981), M. Goodwin (to appear) suggests that speakers require the gaze of their hearers and hold their hearers accountable if they do not return their gaze when they look at them. These studies show that participants use gaze to acquire and relinquish the floor, and hearers can use gaze to create alignments in the conversation. Research on gaze in Japanese has been limited. Kunihiro (1977) and Nishihara (1995) have claimed that Japanese participants make less eye contact than Americans, because direct gaze at a person of higher social status is considered to be impolite. Y. Ikeda & T. Ikeda (1996) found that Japanese speakers divert their gaze at the beginning of zisituteki hatuwa 'substantial utterances' (Sugito 1987), and tend to look at their interlocutor more at the end of these utterances than at the beginning. They also found that gaze is directed at the interlocutor at both the beginning and end of aizuti a high percentage of the time (80%).

Speakers and listeners in Japanese and English may have different expectations about when to look at their interlocutors in different contexts. English speakers may expect their listener to look at them at the beginning of their utterances while Japanese speakers may expect their listeners to be in good timing at the end of their utterances with aizuti and head nods.

Previous research on head nodding in Japanese has focused primarily on its frequency and functions as shown in Table 1 which is taken from Maynard (1989). In a study of casual conversation between 20 pairs each of Japanese and English speakers, Maynard (1989) found that the total number of head movements was almost 3 times as high for Japanese participants (1,372) as for American (452). She also found that both Japanese listeners (36%) and American English listeners (41%) used most of their head movements as 1. continuers, i.e., to indicate that it was okay for the speaker to continue. However, the situation was different for the uses of head nods by speakers, categories 3 through 8. While Japanese speakers used head movements to indicate 3a. clause boundaries and 3b. the end of turns (33%), and 6. agreement (8%), English speakers tended to use
head movements for 7. emphasis (16%). This suggests that Japanese speakers used more head nods to orient towards the ends of utterances while English speakers use head nods throughout their utterances, perhaps together with stress for emphasis.

(1) Table 1. Frequency of head movement in 3-minute segments of conversation between 20 Japanese and 20 American pairs.²

<table>
<thead>
<tr>
<th>Categories of Head Movements</th>
<th>Japanese</th>
<th>American</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Continuer</td>
<td>490 (35.71)</td>
<td>186 (41.15)</td>
</tr>
<tr>
<td>2 Transition Filler</td>
<td>68 (4.96)</td>
<td>18 (3.98)</td>
</tr>
<tr>
<td>3a Clause Boundary</td>
<td>293 (21.36)</td>
<td>32 (7.08)</td>
</tr>
<tr>
<td>3b Turn-end Claim</td>
<td>165 (12.03)</td>
<td>5 (1.11)</td>
</tr>
<tr>
<td>4a Repeated 3a</td>
<td>13 (0.95)</td>
<td>2 (0.44)</td>
</tr>
<tr>
<td>4b Repeated 3b</td>
<td>13 (0.95)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>5a Transition Claimer</td>
<td>60 (4.37)</td>
<td>15 (3.32)</td>
</tr>
<tr>
<td>5b Transition Filler</td>
<td>42 (3.06)</td>
<td>10 (2.21)</td>
</tr>
<tr>
<td>6 Affirmation/Agreement</td>
<td>105 (7.65)</td>
<td>24 (5.31)</td>
</tr>
<tr>
<td>7 Emphasis</td>
<td>24 (1.75)</td>
<td>71 (15.71)</td>
</tr>
<tr>
<td>8 Pre-turn Claim</td>
<td>41 (2.99)</td>
<td>16 (3.54)</td>
</tr>
<tr>
<td>9 Rhythm-creating</td>
<td>40 (2.92)</td>
<td>29 (6.42)</td>
</tr>
<tr>
<td>10a Speaker (with U/un 'No')</td>
<td>17 (1.24)</td>
<td>35 (7.74)</td>
</tr>
<tr>
<td>10b Listener (with U/un 'No')</td>
<td>1 (0.07)</td>
<td>9 (1.99)</td>
</tr>
</tbody>
</table>

TOTAL 1372 452

(Maynard 1989:211; title and headings have been modified slightly, underline mine)

Previous research on *aizuti*, in Japanese has also focused primarily on their frequency and functions. Maynard (1989:207) found that Japanese speakers used twice as many *aizuti* as Americans used back channel utterances, and in both languages (Japanese 81%, English 87%) these forms were used at what she refers to as “pause-bounded phrasal unit boundaries.”

In addition to studies of frequency, many studies have analyzed the functions of head nodding and *aizuti*; at least 25 functions have been proposed for back channel utterances in Japanese, and many functions have been proposed for head nods as shown in Table 1. What is lacking in these previous studies of frequency and function, however, is consideration of how gaze, head nodding and *aizuti* are interrelated, and how their use relates to the conversational goals and roles of the participants. In this study I focus on their interrelation in segments of a company meeting where senior company members are teaching a junior employee about her duties, i.e., in segments where she is the primary addressed recipient.

² Percentages are given in parentheses in all the tables in this paper.
3. Analysis

3.1 Data

The data for this study come from a Japanese company meeting, which was videotaped with 2 cameras. The purpose of the meeting was to orient a new female employee, C, that is, to give her an overview of the company and to teach her what her duties would be. The 4 participants at the meeting, A, B, C, D sat in that order around a table as shown in Frame 0 in the Appendix. The people orienting C were A, B, and D. A is the man on the far left, B is the slightly older man sitting next to A, and D, the woman on the far right, is senior to C but not as experienced as A and B. Overall A performed the role of chair of the meeting by introducing topics to be talked about, B acted as the primary information presenter by giving information about the topics that A introduced, and D acted as a supporting participant, by supporting and commenting on the topics that were being presented, and being a co-recipient with C. A, B, and C belonged to the same division of the company and B was from an outside division. The fact that B was out-group, slightly senior and male, plus that B was the primary information presenter, suggest that B was highest in status followed by A, D and C.

3.2 Statistical Tendencies

I distinguished between 3 types of gaze in my transcription of the conversational segments, 1) direct gaze at the speaker’s head/chest area, 2) indirect gaze at a point in front or near the participants which allowed peripheral vision of the speaker’s head, and 3) diverted gaze which allowed very limited or no peripheral vision of the speaker, e.g., looking down, or at a piece of paper. In the statistical analysis, I combined indirect gaze and diverted gaze and refer to them as non-direct gaze when there were not enough examples in my data to analyze differences between these gaze types.

Tables 2 and 3 show how the addressed recipient, C, the new employee, responded to the other participants’ (A, B, D) presentation of information during the meeting. Each table is made up of 4 smaller tables, a table for speaker A, speaker B, and speaker D, and a total table for speakers A, B, and D combined. Table 2 shows how C responded to each speaker’s direct gaze + head nod, direct gaze only, non-direct gaze + head nod, and non-direct gaze only (i.e., non-direct gaze without a head nod). Addressed recipient C’s responses, which are given across the top of each table, included aizuti + head nod(s), head nod(s) alone, and neither of these behaviors. Table 3 shows how C responded to each speaker’s direct gaze, indirect gaze and diverted gaze. Addressed recipient C’s responses included direct gaze and non-direct gaze.

I observed three patterns in the interrelation between the speaker's use of gaze and head nods and the addressed recipient's use of aizuti and head nods as shown in Table 2, and two patterns in the interrelation between speaker's gaze and addressed recipient's gaze as shown in Table 3. For the statistical analysis I used log linear contingency table analysis to evaluate the interdependencies of
addressed recipient's gaze and *aizuti* and head nods on the speaker's gaze and head nods.

(2) Table 2. Effect of Speaker's Gaze and Head Nods on Addressed Recipient's *Aizuti* and Head Nods

<table>
<thead>
<tr>
<th>Speaker A</th>
<th>Speaker B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addressed Recipient</td>
<td>Addressed Recipient (C)</td>
</tr>
<tr>
<td><strong>Speaker</strong></td>
<td><strong>aizuti+</strong></td>
</tr>
<tr>
<td>Direct gaze + head nod</td>
<td>(12)</td>
</tr>
<tr>
<td>Direct gaze only</td>
<td>(8)</td>
</tr>
<tr>
<td>Non-direct gaze + head nod</td>
<td>(38)</td>
</tr>
<tr>
<td>Non-direct gaze only</td>
<td>(5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speaker D</th>
<th>Total (Speakers A, B, and D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addressed Recipient</td>
<td><strong>Section V</strong></td>
</tr>
<tr>
<td><strong>Speaker</strong></td>
<td><strong>aizuti+</strong></td>
</tr>
<tr>
<td>Direct gaze + head nod</td>
<td>(12)</td>
</tr>
<tr>
<td>Direct gaze only</td>
<td>(11)</td>
</tr>
<tr>
<td>Non-direct gaze + head nod</td>
<td>(50)</td>
</tr>
<tr>
<td>Non-direct gaze only</td>
<td>(4)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
</tr>
</tbody>
</table>

In Table 2, the Effect of Speaker's Gaze and Head Nods on the Addressed Recipient's *Aizuti* and Head Nods, I did not include the addressed recipient's gaze because the addressed recipient's gaze was affected by the speaker's gaze (Table 3), but not by both the speaker's gaze and head nods. First, Table 2 shows that the

1) Addressed recipient was most likely to respond with an *aizuti* plus a head nod(s) when the speaker gazed directly at her and nodded.

The total table under Table 2, shows that C responded with an *aizuti* + head nod, when the speaker gave her direct gaze + head nod 65% of the time.

Second, Table 2 shows that the

2) Addressed recipient rarely responded with an *aizuti* (plus a head nod(s)) when the speaker neither nodded nor gazed at her directly. At these
times the addressed recipient tended to punctuate the speaker's talk with head nods.

The total table under Table 2, shows that C only responded with an *aizuti* + head nod 11% of the time, when the speaker neither nodded nor gazed at her directly. At these times, the addressed recipient responded with head nods 50% of the time.

Third, Table 2 shows that

3) Addressed recipient tended to nod when the speaker nodded.

Overall the addressed recipient returned the speaker's nod(s) 87% of the time.

These statistics indicate that when the addressed recipient received a head nod, she tended to give a head nod. When the addressed recipient received a head nod with direct gaze, she tended to give an *aizuti* + head nod back.

(3)Table 3. Effect of Speaker’s Gaze on Addressed Recipient’s Gaze

<table>
<thead>
<tr>
<th>Addressed Recipient</th>
<th>Speaker A (p&lt;0.21)</th>
<th>Speaker B (p&lt;0.001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (53 utt) → C (26 <em>aizuti</em>)</td>
<td>B (143 utt) → C (58 <em>aizuti</em>)</td>
<td></td>
</tr>
<tr>
<td><strong>Speaker</strong></td>
<td><strong>Addressed Recipient (C)</strong></td>
<td><strong>Addressed Recipient (C)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>direct gaze</strong></td>
<td><strong>non-direct gaze</strong></td>
</tr>
<tr>
<td>Direct gaze</td>
<td>37 (82)</td>
<td>8 (18)</td>
</tr>
<tr>
<td>Indirect gaze</td>
<td>8 (50)</td>
<td>8 (50)</td>
</tr>
<tr>
<td>Diverted gaze</td>
<td>5 (71)</td>
<td>2 (29)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50</td>
<td>18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Addressed Recipient</th>
<th>Speaker D (p&lt;0.08)</th>
<th>Total (Speakers A, B, and D) (p&lt;0.001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D (52 utt) → C (25 <em>aizuti</em>)</td>
<td>A+B+D (248 utt) → C (109 <em>aizuti</em>)</td>
<td></td>
</tr>
<tr>
<td><strong>Speaker</strong></td>
<td><strong>Addressed Recipient (C)</strong></td>
<td><strong>Addressed Recipient (C)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>direct gaze</strong></td>
<td><strong>non-direct gaze</strong></td>
</tr>
<tr>
<td>Direct gaze</td>
<td>36 (92)</td>
<td>3 (8)</td>
</tr>
<tr>
<td>Indirect gaze</td>
<td>9 (75)</td>
<td>3 (25)</td>
</tr>
<tr>
<td>Diverted gaze</td>
<td>7 (47)</td>
<td>8 (53)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>52</td>
<td>14</td>
</tr>
</tbody>
</table>

Results for the Effect of Speaker's Gaze on the Addressed Recipient's Gaze are given in Table 3. The total table under Table 3 shows that

4) Overall, the addressed recipient met the speaker's direct gaze with direct gaze 79% of the time.

However, there was some variation depending on the speaker; the addressed recipient returned the speaker's gaze 92% of the time D looked at her, 82% of the time A looked at her, and 68% of the time B looked at her. Because the speaker's relative status in relation to C in increasing order was D, A, and C, this finding supports Kunihiro (1977) and Nishihara's (1995) claim that Japanese people tend to not look at people of higher status. C's relative proximity to each of the speakers may also have influenced the speaker's gaze because it may be easier for speakers to gaze at someone at a distance than at someone in one's immediate proximity. The fact that B gazed at C less when B was the speaker than A gazed
at C when A was the speaker may be related to the fact that B was sitting closer
to C. Although C is equidistant between B and D, she may have felt less
comfortable looking at D, the most senior member of the meeting, because he was
sitting at such close proximity. Similarly, the fact that A, the second highest in
status at the meeting, was sitting the furthest away from C may account for why
C returned A's gaze 82% of the time. More data is necessary to be able to
determine the influence of these factors.

Table 3 also shows that

5) Overall, during the speaker's indirect or diverted gaze, the addressed
recipient directed her gaze at the speaker slightly less than half of the
time.

This suggests that the addressed recipient gazed at the speaker relatively
frequently when he/she was not being looked at by the speaker. However, again I
found that C gazed at B, the most senior member of the meeting, less than she
gazed at A and D, whether B was looking at her or not.

Finally, I found that

6) When the addressed recipient and the speaker's eyes met in a mutual
direct gaze, they often held this eye contact until the addressed recipient
gave an aizuti (plus a head nod(s)) or a head nod alone, and then one or
the other, or both would break this mutual gaze.

3.3 An Example from the Data

In the excerpt in the Appendix, B, the older male from the outside division, is
addressing C and describing one of the products that they sell at the company, a
wafer film or membrane that they put on machines. B is trying to think of a word
in Frames 1-4, 1B- Mot, ano: kitio:n to maku ga sarete ru to, 2B- motto kiree na,
sono, 3B- nan te iu no ka, 4B- ano: e:, 'More, uhm when the film is put on right, a
more pretty, that, what is it you call it, uhm uhm,' In Frame 1 C nods twice while
sharing indirect gaze with B, and this is an example of Pattern 2 [the addressed
recipient punctuates speaker's talk with head nods while sharing indirect gaze].

Next, in Frame 2 when B starts to say 2B- motto kiree na, sono, 'a more
pretty, that', he draws a circle near the table with his right index finger, and when
he says in Frames 3 and 4, 3B- nan te iu no ka, 4B- ano: e:, 'what is it you call it,
uhm uhm,' he draws 3 concentric circles with his right index finger. Then in Frame
5, after B says, 4B- ano: 'Uhm', C gives a large nod. This nodding during indirect
gaze is another example of Pattern 2 [the addressed recipient punctuates the
speaker's talk with head nods while sharing indirect gaze]. Then when A gives B
the word he is looking for in Frame 5, 6A- Doosinen. 'Concentric circles.' C and D

3 In the video frames I indicate small head nods with small hooks and large head nods with large
hooks. Under the romanization of the transcript I also indicate small head nods with lower case
letters, and large head nods with capital letters, using the letter of the participant who nodded.
direct their gaze briefly at A and then gaze right back at B when he repeats the word partially in 6B-en, 'circle'.

Next, in Frames 8 and 9, B says, 7B-To, doosinen tte iu no? 'It's that it's called a concentric circle?', trying to get confirmation from C that C understands what he is getting at here. During this utterance B nods his head 3 times and gazes at C, and C responds with direct gaze, the aizuti Hai 'Yes' and 3 large head nods. This is an example of Pattern 1 [direct gaze + head nod(s) elicits an aizuti + head nod(s)]. D accompanies C's last two head nods with 2 small head nods.

Then in Frames 10 through 13, B reiterates what he has just said, 9B-Ano kiree na 10B-ano moyoo ni 11B-ano, 12B-narimasu. 'Uhm a pretty uhm pattern comes to be'. D's small head nod, and C's large head nod in Frames 10 and 11, respectively, are examples of Pattern 2 [the addressed recipient punctuates the speaker's talk with head nods while sharing indirect gaze]. Then in Frame 12, when B says 11B-ano 'uhm', he gives a large nod and gazes directly at C, followed by another large head nod in 12B-narimasu. 'comes to be.' before he changes to indirect gaze. Then C gives an aizuti in 13C-Hai. 'Yes.' together with a large and a small head nod. This is another example of Pattern 1 [direct gaze + head nod(s) elicits an aizuti + head nod(s)].

4. Conclusion
In conclusion, although previous studies have focused on the frequency and function of head nods and aizuti as independent behaviors, and indeed these analyses point to differences between English and Japanese, the present study shows that gaze, head nods and aizuti are interrelated. This interrelation is also very important for participation in Japanese conversation.

Even though the new employee had very little to contribute linguistically (she said very few substantial utterances during the 2-hour meeting), she contributed a great number of aizuti and head nods. By showing that she knew when to chime in, rather than what she knew, C displayed the appropriate attitude of a person being initiated into a Japanese company.

Miscommunications between Japanese and English speakers are caused by Japanese native speakers who over-punctuate English conversations with head nods and responses and often make a bad impression because they appear to agree, although they later disagree. Miscommunications are also caused by English native speakers, who by not nodding enough and gazing too intently at native Japanese speakers in Japanese conversations, do not convey the message that they are listening and being attentive. It is not only an understanding of the frequency of use but also the interrelation of the use of gaze, head nodding and aizuti that is necessary to prevent these misunderstandings. The present analysis

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4 It is interesting that the main information presenting participant B does not look at A when he gives him the word, but keeps looking at his hand which is perched in the air (Szatrowski 2000).

5 I counted this as an example of Pattern 1 although B changes to indirect gaze immediately before C gives her aizuti in 13C, because the rhythm in this section of the conversation suggested that C was responding to B's direct gaze rather than his change to indirect gaze.
is meant as a first step towards investigating the interrelation of these behaviors in one conversation. Investigation of the interrelation of these behaviors with the content and prosody of the utterances and various factors such as gender, status, proximity, number of participants, etc. awaits future study.

References


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Appendix

1B  Mot. ano: kitto n to maku ga sarete ru to.
  c       c
  More, uhm when the film is put on right.

2B  motto kiree na, sono.
    a more pretty, that.
3B  *nan te iu no ka,*  
    what is it you call it.

4B  *ano: e.,*  
    C  
    uhm uhm.

5A  *Doosin/en.*  
    Concentric circles.

6B  *en.*  
    circle

7B  *To.* [quotative particle]  
    B

7B  *doosinen tte iu no?*  
    B  B
    It’s that it’s called a concentric circle?
8C  Hai.
    C CC
d d
Yes.

9B  Ano kiree na d
    Uhm a pretty

10B  ano moyoo ni
    C
    uhm pattern

11B  ano.
    B
    uhm.

12B  narimasu.
    B
    comes to be.

13C  Hai.
    C c
    Yes.
Voice Quality Differences and the Origin of Diphthongs

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California State University, Chico

1. Introduction
The literature documents a widely-noted correlation between three clusters of features widely-distributed in Southeast Asian languages: a so-called tense register (associated with several distinct voice quality or phonation types (specifically, with creaky, tense, and sometimes harsh voice)), a modal register, which is unmarked, and a breathy-voiced register (associated with breathy voice). See Figure 1 for the three bundles of co-occurring features.

Figure 1: The three most common register complexes

<table>
<thead>
<tr>
<th></th>
<th>Tense Register</th>
<th>Unmarked</th>
<th>Breathy Register</th>
</tr>
</thead>
<tbody>
<tr>
<td>original initials:</td>
<td>proto-voiceless</td>
<td>voiced/voiceless</td>
<td>proto-voiced</td>
</tr>
<tr>
<td></td>
<td>(esp. obstruents) &gt;</td>
<td></td>
<td>(esp. obstruents) &gt;</td>
</tr>
<tr>
<td>voice quality:</td>
<td>creaky, tense, or harsh</td>
<td>modal (clear)</td>
<td>breathy</td>
</tr>
<tr>
<td>vowel quality:</td>
<td>lower (open);</td>
<td></td>
<td>higher (closed);</td>
</tr>
<tr>
<td></td>
<td>more fronted vowels</td>
<td></td>
<td>more backed vowels</td>
</tr>
<tr>
<td>diphthongization:</td>
<td>tendency to offglides</td>
<td></td>
<td>tendency to onglides</td>
</tr>
<tr>
<td>length:</td>
<td>often shorter</td>
<td></td>
<td>(centralization)</td>
</tr>
<tr>
<td>pitch distinctions:</td>
<td>higher pitch;</td>
<td></td>
<td>often longer</td>
</tr>
<tr>
<td></td>
<td>associated with -?</td>
<td></td>
<td>lower pitch;</td>
</tr>
<tr>
<td></td>
<td>and/or laryngeal tension</td>
<td></td>
<td>association with -h</td>
</tr>
<tr>
<td>state of larynx:</td>
<td>larynx tense and/or</td>
<td></td>
<td>and/or laryngeal laxness</td>
</tr>
<tr>
<td></td>
<td>raised (= reduced</td>
<td></td>
<td>larynx lax and/or</td>
</tr>
<tr>
<td></td>
<td>supraglottal cavity)</td>
<td></td>
<td>lowered (= increased</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>supraglottal cavity)</td>
</tr>
</tbody>
</table>

Figure 1 is a modified and selectively-chosen composite of Henderson 1952 & 1977, Matisoff 1973:76, Edmondson and Gregerson 1993:61-63, and Bradley 1982. Notice also that the listing in Figure 1 contains the same phonetic features
Henderson uses to characterize a typical Southeast Asian tone system.\(^1\)

It is important to note that the first diachronic stage is the development of a marked register. There are several potential origins for this voice quality difference. For example, the voiced obstruent series might develop into a breathy-voiced series, the proto-voiceless obstruent series might develop into a so-called tense-voiced series (less likely), or, alternately, the existence of final glottal stops might lead to a tense-voiced series. It is these resultant voice qualities that are associated with the remaining clusters of features. Further note that it is only necessary for one marked voice quality to emerge; once one has made its appearance, the system now has a marked voice quality distinction.

Of the remaining features, it is the vowel quality distinctions found in two particular manifestations, that are of special interest here. The most obvious manifestation is the widely-noted correlation of tense (or, creaky, or harsh) voice quality with both lowered and fronted vowels and the correlation of breathy voice quality with raised and backed vowels. The other manifestation, not as widely noted, is between the so-called tense register and diphthongs (offglides), on the one hand, and between the so-called breathy register and centralization (onglides), on the other. It will be argued in this paper that, in large part, the correlation between voice quality and diphthongization patterns is simply another manifestation of the tendency of tense vowels to lower and front and of breathy vowels to raise and back.

2. Vowel quality and voice quality correlations
The correlations between voice quality and vowel quality are widely noted. In Burmese, it is evident from Thein Tun’s (1982:94) acoustic study that vowels developed from the historical breathy-voiced register (Bradley 1982) tend to be “higher” and “more backed”, while the vowels associated historically with the creaky-voiced register tend to be “lower” and “more fronted”. Countless others have observed that breathy-voiced vowels tend to be higher, while tense-voiced vowels tend to be lower (e.g., Henderson 1952 & 1977; Huffman 1976; Denning 1989; Hombert 1978; Bradley 1982; and so on). The observation that tenseness (laryngealization, harsh or creaky voice, that is, any voice quality with heightened tenseness) correlates with lower vowels is widely reported: Mpi (Denning

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\(^1\) I have to acknowledge that the merits of this work owe much to the contributions of Peter Ladefoged, Jerry Edmondson, John Ohala, Ian Maddieson, Theraphan Thongkum, Gérard Diffloth, Marc Hideo Miyake, George Grace, William Gage, David Solnit, Justin Watkins, Martha Ratliff and Blaine Erickson. The works of Theraphan Thongkum, Jerry Edmondson, Keith Denning, Eugénie Henderson, Kenneth Gregerson, Ian Maddieson, Jean-Pierre Hombert, John Ohala, and James Matisoff have been the foundations for this study.

Aside perhaps from my attempt to treat the articulatory and acoustics behind development of certain diphthongs, this paper makes no claims to originality. Thus, it was written to pull certain things together that are found in various places in the literature.

I should be astonished if all my errors are minor and grateful for correction from readers.
Voice quality differences and the origin of diphthongs

1989:29-33), Hani (Maddieson and Ladefoged 1985:67-70), Western Cham (Edmondson and Gregerson 1993), various languages of the world (Denning 1989).

Figure 2: The correlation of voice quality with vowel height and fronting

Effects of voice quality on vowel height (F1)

**breathy voice:**  
lowered larynx >  
longer vocal tract >  
lower formants >  
higher vowels

**creaky voice:**  
raised larynx >  
shorter vocal tract >  
higher formants >  
lower vowels

Effects of voice quality on fronting:

**breathy voice:**  
lowered larynx  
longer vocal tract  
lower vowels

**creaky voice:**  
raised larynx  
shorter vocal tract  
higher vowels

In some cases, the correlation between voice quality and vowel quality is really a correlation between voice quality and vocal tract length. That is, breathiness frequently correlates with a lowering of the larynx and tenseness with raising. Thus, when the larynx is lowered, the vocal tract is lengthened; the lengthened vocal tract lengthens the wave lengths of the sounds and generally lowers the formants. Thus, all other things being equal, under the lowering of the larynx associated with breathy voice the F1 would be lower, making the vowels higher. Conversely, when the larynx is raised in association with tense voice (or, creaky, or harsh voice), the vocal tract is shortened; the shortened vocal tract shortens the wave lengths of the sounds and generally raises the formants. Consequently, with the raising of the larynx the F1 is be higher, making the
vowels lower. With the fronting and backing of vowels parallel correlations are found, but here it is the effect on F2 that is being tracked: the larynx is lowered in association with breathy voice, the vocal tract is lengthened, the lengthened vocal tract lengthens the wave lengths, lowering the formants. Conversely, the raising of the larynx in association with the production of tense voice with the consequent shortening of the vocal tract, which results in shortened wave lengths, and produces higher formants. Thus, vowels with a lower F2 are more backed; those with a higher F2 are more fronted. These correlations are presented graphically in Figure 2.2

3. Correlations with diphthongization patterns
Various scholars including Henderson (1977) have noted correlations of voice quality with diphthongization patterns, particularly the tendency of the tense register to correlate with offglides but the breathy register to correlate with onglides (centralization). In a similar vein and most likely referring to the same languages, Huffman (1985:144) also observed that correlations between voice quality and vowel quality hold for the onsets of long vowels in the registers of various Mon-Khmer languages: tenseness produces lowered onsets in high and mid vowels, while laxness produces raised onsets in low and mid vowels; hence, diphthongization in both cases.

Figure 3. Diachronic paths leading to register systems (Huffman).

<table>
<thead>
<tr>
<th>Proto-</th>
<th>Conservative</th>
<th>Transitional</th>
<th>Register</th>
<th>Restructured</th>
<th>(Tonal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd</td>
<td>*/gaa/</td>
<td>/gaa/</td>
<td>/kˈaa/</td>
<td>/kəa/</td>
<td>(/kàa/)</td>
</tr>
<tr>
<td>1st</td>
<td>*/kaa/</td>
<td>/kaa/</td>
<td>/kaa/</td>
<td>/kaa/</td>
<td>(/káa/)</td>
</tr>
</tbody>
</table>

2 This figure developed out of a conversation in the summer of 1997, in which I asked Peter Ladefoged how breathy voice could end up producing higher vowels. Subsequently, I primarily listened as Peter Ladefoged explained to me how a lower larynx led to a longer vocal tract, how a longer vocal tract led to lower F1 formants, and how lower F1 led to higher vowels. As noted elsewhere in the paper variants of this observation are found various places in the literature. Had I thought at the time to ask how breathy voice could also end up producing backer vowels, doubtless that would have been made clear to me then, too, but it wasn't until a month or so later that I became aware of the vowel backing effect of breathy voice. However, the extension of the notion to F2 was obvious enough even for me to grasp; doubtless it too is in the literature and I will be happy to cite it if someone would be kind enough to point it out to me. For instance, I suspect that it is somewhere in Silverman (1997) but thus far I have not found it; it is implicit in it, if not explicit.
Voice quality differences and the origin of diphthongs

Before discussing the diphthongization patterns, however, Huffman (1985:141) briefly sketches the diachronic paths that have led to the development of register (and tonal) distinctions in a number of Mon-Khmer languages (The tonal developments will be ignored here). Reading Figure 3 from left to right, it begins with the proto-language, with a contrast between voiceless initials (ultimately to be associated with the so-called first register) and voiced initials (ultimately to be associated, in languages with such distinctions, with the so-called second register, often a breathy register). This initials contrast is still maintained unaltered in Huffman's conservative dialects. The next stage is Huffman's transitional dialects, in which the voiced stops have developed into breathy-voiced stops, typically becoming voiceless aspirated stops with the breathiness, of course, manifested on the vowel. The next stage is Huffman's register stage, in which the system has essentially into two phonetically-distinct sets of vowels, one in the breathy register and one in the contrasting register (however, it is not unknown for one or more vowels not to participate in this split). If the vowel distinctions remain but the voice quality differences that originally conditioned them disappear, we have Huffman's restructured register. Of course, this is not just idealized but there are also other paths to the development of register systems.

4. The development of onglides.
One of the vocalic developments pictured in Huffman's schematic (Figure 3) shows the development of an onglide: the change of the earlier, long, breathy-voiced /aa/ of /kìa/ into the ongliding /ia/ of /kìa/. This development, this paper argues, is due to the influence of breathiness on the first mora of the vowel; the F1 has been raised, lowering the vowel and producing the ongliding /i/. Quite similarly in Haroi, a Chamic language of Vietnam, long /aa/ has developed into /ia/ under the influence of earlier breathiness induced by what were historically voiced stop onsets. Not coincidentally it is apparently only long vowels that seem to develop onglides and offglides.

5. The development of offglides
Huffman (1985:142) also provides a chart illustrating the development of offglides as well as several offglides in various Khmer dialects (Figure 4). The figure deals the effects of voice quality on vowels under the influence of what
Huffman reconstructs as a the breathy-voiced second-register in contrast with a tense-voiced first register.

Figure 4. The development of diphthongs in Khmer dialects (Huffman 1985).

Several patterns in Figure 4 merit comments. First, the vowels themselves were originally long (as, in a sense, are the resultant diphthongs). Second, as Huffman notes, the onsets of the high vowels lower under first register, but not under breathy register. Impressionistically, the ‘failure’ of the high vowels to raise under breathy register is not particularly surprising; where would they go? However, it would be interesting to examine them instrumentally. Although not found in this data set, in a similar way, impressionistically the long vowels are not further lowered under the tense register. Third, the onsets of the two back low vowels are raised under the influence of breathy voice.

6. Toward a ‘real’ explanation
Some parts of the explanation seem clear; other parts remain to be clarified. It is certainly clear that the origin of these diphthongs involves (1) long vowels in which the first and second mora have distinct voice qualities and (2) these vowel quality differences correlate in a straightforward way with the diphthongization patterns. Long vowels in which the first and second mora have distinct voice qualities are not particularly uncommon in Southeast Asia (and elsewhere). In fact, there is convincing instrumental documentation: in Bai, a Sino-Tibetan language of China, there are long vowels that have harsh-modal sequences and breathy-tense sequences (Edmondson et al. ms.); in Chong, there is a register in
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which vowels have a clear-creaky sequence and another in which vowels have a breathy-creaky voice (Thongkum 1988, 1990, 1991, cited in Silverman 1991:62); and there are a number of others that are documented); and, a number of others could easily be cited. It is equally clear that the diphthongization patterns correlate with the voice quality differences.

However, despite my focus on vocal tract length as an explanation of the correlations between voice quality and vowel quality, it is unlikely that vocal tract length explains all of the correlations in the literature between vowel quality and voice quality. Certainly the literature suggests a correlation between voice and vowel quality with larynx height (Lindblom and Sundberg 1971, Jacobson 1980, Silverman 1997, to cite three) and it does seem that at least some of the changes in vowel height and frontness are due to changes in the size of the vocal tract. Further, although I have not yet found explicit references, observations about parallel correlations between voice quality differences and relative vowel frontness must also be in the literature. In any case, the question of whether such correlations exist does not seem to be a major issue of contention.

However, in some cases larynx height may not be the causative variable. Indeed, in some cases it looks as if the larynx movement is secondary. Jacobson (1980:185-186), for instance, notes that pharyngeal constriction results in the raising of the larynx, while suggesting the possibility that the pharyngealization itself was the causative factor in the accompanying vowel raising, with the raising of the larynx being secondary. Certainly, this is the position taken by Gregerson (1976). Thus, while having found a correlation, the intriguing question of precise causation still eludes us.

Nonetheless, whatever the precise diachronic mechanisms were, it is clear that the diphthongization patterns discussed above originated in the phonetics of bimoraic vowels in which the individual moras differed in their voice quality — the breathy voice generally producing raised onsets and the creaky producing lowered onsets (and codas).

References


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Voice quality differences and the origin of diphthongs


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A Usage-Based Approach to Child Language Acquisition

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0. Introduction

The modern study of child language acquisition began when developmentalists started to take Linguistics seriously. For many researchers this has meant a top-down approach in which we begin with some more or less formal description of adult language and then investigate the ways in which children's linguistic skills come to conform with that description. Other researchers have taken a more bottom-up approach in which we assume as little as possible about the nature of children's language and then attempt to characterize it in its own terms - based on children's actual use of language at particular developmental periods (in both comprehension and production). Because our characterizations are based on children's language use, we may call this a usage-based methodology.

In modern Cognitive and Functional Linguistics the term usage-based has, in addition, a number of more substantive meanings. Most important is the proposition that language structure emerges - both historically and ontogenetically - from language use. In the context of first language acquisition, I take this to mean that children begin their linguistic careers with concrete and specific linguistic constructions, and create abstractions only gradually through repeated acts of language comprehension and production in specific usage events. This perspective is also broadly consistent with a Construction Grammar view in which our account of linguistic competence includes not only the most regular aspects of language structure, but also - and perhaps even as a primary starting point - all of the idioms, fixed expressions, and other quirky aspects of human language use (Fillmore et al., 1988; Kay & Fillmore, 1999).

One especially important proposal of some usage-based theorists is that frequency matters. That is to say, certain linguistic expressions and constructions are used so often that they become entrenched for individuals as wholistic units of psycholinguistic processing - regardless of any internal structure they may have in addition (Bybee 1985, 1995; Langacker 1987; 1988). Given this focus on usage events - and on the processes of language learning and structure building that occur in usage events, with the frequency of certain kinds of usage events being extremely important - a crucial item on the research agenda of usage-based models of language is, or should be, the study of how human beings build up the most basic aspects of their linguistic competence during childhood.

In this paper I report on recent research in child language acquisition that
is broadly compatible with a usage-based approach to language. The points I will attempt to make are the following: (i) children's early language is item-based; (ii) children's earliest creative utterances are grounded in these item-based constructions; (iii) this concrete organization lasts longer than previously suspected and even characterizes children's early complex constructions (sentential complements and relative clauses); and (iv) the processes by which children acquire and abstract across item-based constructions all reflect general processes of human cognition.

1. **Verb Islands and Other Item-Based Constructions**

Many researchers believe that young children operate from the beginning with abstract linguistic categories and schemas because they not only follow adult grammatical conventions fairly well, but they also on occasion produce some creative yet canonical utterances that they could not have heard from adults - which means that they must be generating them via abstract linguistic categories or schemas. The most famous example is *Allgone sticky*, as reported by Braine (1971), and indeed such creativity is convincing evidence that the child has some kind of abstract linguistic knowledge. However, recent evidence suggests that, in this example, the only abstract knowledge this child possesses is what kinds of things can be *allgone* - not, for example, what kinds of things may be the subjects or objects of verbs. The general methodological problem is that we can never tell from a single utterance in isolation what is the child's underlying structural knowledge. To determine underlying structural knowledge we must look at *all* of a child's uses - and most especially non-uses - of a whole set of linguistic items or structures.

Using this more systematic method, Tomasello (1992) found that although most of his daughter's early language during her second year of life was "grammatical", it was also very limited, uneven, and item based. The item based nature of this child's early language was most clearly evident in her use of verbs. Thus, during exactly the same developmental period some semantically similar verbs were used in only one type of sentence frame and that frame was quite simple (e.g., *Cut X*), whereas other verbs were used in more complex frames of several different types (e.g., *Draw X, Draw on X, Draw X for Y, Z draw on Q*). In addition, morphological marking (e.g., for past tense) was also very uneven across verbs. Within a given verb's development, however, there was great continuity, with new uses almost always replicating previous uses with only one small addition or modification (e.g., the marking of tense or the adding of a new participant role). Overall, by far the best predictor of this child's use of a given verb on a given day was *not* her use of other verbs on that same day, but rather her use of that same verb on immediately preceding days; there appeared to be no transfer of structure across verbs. The hypothesis was thus that children have an early period in which each of their verbs forms its own island of organization in an otherwise unorganized language system (the Verb Island hypothesis), thereby serving to define lexically specific syntactic categories such as 'drawer', 'thing drawn', and 'thing drawn with' (as opposed to subject, object, and instrument) (see also Tomasello & Brooks, 1999).

Using a combination of periodic sampling and maternal diaries, Lieven et
al. (1997) found some very similar results in a sample of 12 English-speaking children from 2 to 3 years of age. In particular, they found that children used virtually all of their verbs and predicative terms in one and only one sentence frame early in language development - suggesting that their syntax was built around various particular items and expressions. In fact, fully 92% of these children's earliest multi-word utterances emanated from one of their first 25 lexically based patterns - which were different for different children. Following along these same lines, Pine and Lieven (1997) found that when these same children began to use the determiners a and the in the 2 to 3 year period, they did so with almost completely different sets of nouns (i.e., there was almost no overlap in the sets of nouns used with the two determiners) - suggesting that the children at this age did not have any kind of abstract category of Determiner that included both of these lexical items. This general finding of the item based learning and use of language has now been replicated in a number of different languages of many different types (e.g., see Pizutto & Caselli 1992, 1994, for Italian; Serrat 1997, for Catalan; Behrens 1998, for Dutch; Allen 1996, for Inuktitut; Gathercole, Sebastián, & Soto 1999, for Spanish; Rubina & Pine 1998, for Portuguese; Stoll 1998, for Russian; and Berman 1982, 1993, for Hebrew).

Of special note in children's spontaneous speech are so-called overgeneralization errors because they are things the child has presumably not heard from adults. In the context of a focus on syntax, the overgeneralizations of most interest are those involving basic sentence frames, for example, She falled me down or Don't giggle me in which the child uses intransitive verbs transitively (i.e., a verb normally used with a subject only is used with both a subject and an object). Bowerman (1982, 1988) documented a number of such overgeneralizations in the speech of her two English-speaking children, and Pinker (1989) compiled examples from other sources as well. The main result of interest is that these children produced very few of these types of overgeneralizations before about 3 years of age. This developmental pattern suggests again the hypothesis that the construction of abstract linguistic categories and schemas is a gradual process that takes place over many months, and even years, of ontogeny.

The other main method for studying the nature of children's linguistic knowledge involves teaching them novel linguistic items and seeing what they do with them. The idea is that if the child uses the novel item in creative yet canonical ways, we may infer that she has assimilated it to some kind of abstract category or schema. If she does not use it in any creative ways (despite repeated opportunities), but only in ways she has heard from adults, the inference is that there is no abstract system to take up the new element, and the child is simply imitatively learning a specific linguistic item or structure (assuming that there are no performance limitations, involving limited memory or the like, that prevent the child from demonstrating her syntactic competence in the experiment).

Experiments using novel verbs have demonstrated that by 3 to 4 years of age most children can readily assimilate novel verbs to abstract syntactic categories and schemas that they bring to the experiment, for example, taking a verb they have heard only in a passive sentence frame and using it in an active sentence frame (Maratsos et al. 1987; Pinker et al. 1987). But the same is not true
for younger children. For example, Tomasello and Brooks (1998) exposed 2 to 3 year old children to a novel verb used to refer to a highly transitive and novel action in which an agent was doing something to a patient. In the key condition the novel verb was used in an intransitive sentence frame such as *The sock is tamming* (to refer to a situation in which, for example, a bear was doing something that caused a sock to "tam" – similar to the verb *roll* or *spin*). Then, with novel characters performing the target action, the adult asked children the question: *What is the doggie doing?* (when the dog was causing some new character to tam). Agent questions of this type encourage a transitive reply such as *He's tamming the car* - which would be creative since the child has heard this verb only in an intransitive sentence frame. The outcome was that very few children at either age produced a transitive utterance with the novel verb. As a control, children also heard another novel verb introduced in a transitive sentence frame, and in this case virtually all of them produced a transitive utterance - demonstrating that they can use novel verbs in the transitive construction when they have heard them used in that way.

The generality of this finding is demonstrated by a number of similar studies using different modeled constructions and measurement procedures. These studies have used children of many different ages and have tested for a variety of different constructions (see Tomasello 2000, for a review). Most of the findings concern children's ability to produce a simple transitive utterance (subject-verb-object; SVO), given that they have heard a novel verb only in some other sentence frame (e.g., intransitive, passive, imperative, etc.). When all of these findings are compiled and quantitatively compared, we see a continuous developmental progression in which children gradually become more productive with novel verbs during their third and fourth years of life and beyond. It is clear that this overall pattern is not consistent with the hypothesis that children possess abstract linguistic knowledge early in development, but rather it is consistent with a more constructivist or usage-based model in which young children begin language acquisition by imitatively learning linguistic items directly from adult language, only later discerning the kinds of patterns that enable them to construct more abstract linguistic categories and schemas.

The validity of these findings is further corroborated by two control studies that deal with alternative hypotheses. First, it is possible that young children are simply reluctant to use newly learned words in novel ways. However, when even younger children (22 months) are taught novel nouns, they use them quite freely in novel sentence frames (Tomasello et al., 1997). Young children are thus not reticent with all newly learned words, and indeed they seem to form something like a category of ‘concrete noun’ quite early in development. Second, it might be that children's lack of productivity in the novel verb studies does not have to do with their linguistic knowledge, but only with production difficulties. However, in comprehension tests they perform no better. That is, they are first taught a novel verb in a simple sentence frame (*Look! Tamming! This is called tamming!*), and they are asked to act out a transitive construction with that verb: *Show me: The dog's tamming the cat.* Perhaps surprisingly, children younger than 3 years of age do no better in comprehension than they do in production (Akhtar & Tomasello 1997). (The study of Naigles (1990) is sometimes taken to be
discrepant with these findings, but in fact it is not relevant because the two sentences that were compared in that study were *The duck is glorp a the bunny* and *The bunny and the duck are glorp ing* - with one picture depicting the duck doing something to the bunny and the other depicting the two participants engaged in the same parallel action. The problem is that children might very well have been using the word *and* as an indicator of the parallel action picture; Tomasello & Olguin 1993)

2. **Usage-Based Syntactic Operations**

Given that children are acquiring linguistic constructions of various shapes and sizes and degrees of abstraction throughout early development (i.e., building their linguistic inventories), we may now ask about their ability to put these constructions together creatively in order to adapt to the exigencies of particular usage events. Tomasello, Lieven, Behrens, and Forwerck (2000) addressed this issue in a naturalistic study of one 2-year-old child learning English. The novelty was that this child's language was recorded using extremely dense taping intervals. Specifically, the child was recorded in linguistic interaction with her mother for one hour per day, 5 days per week, for 6 weeks - making the taped data roughly 5 to 10 times denser than most existing databases of child language, and accounting for approximately 8 to 10% of all of the child's utterances during this 6 week period. In order to investigate this child's syntactic creativity, all of her 500+ utterances produced during the last one-hour taping session at the end of the 6 week period were designated as target utterances. Then, for each target utterance, there was a search for 'similar' utterances produced by the child (not the mother) in the previous 6 weeks of taping. Was it an utterance she had said before exactly? Was it an utterance based on some highly frequent schema from before but with a new linguistic item in the slot? Was it an utterance pieced together from previously mastered language in some more creative way? Or did the target utterance have no previous precedents in the child's productive language at all?

The main goal was thus to determine for each utterance recorded on the final day of the study what kinds of syntactic operations were necessary for its production, that is to say, in what ways did the child have to modify things she had previously said (her 'stored linguistic experience') to produce the thing she was now saying. We may call these operations 'usage-based syntactic operations' since they explicitly take into account that the child does not put together each of her utterances from scratch, morpheme by morpheme, but rather, she puts together her utterances from a motley assortment of different kinds of pre-existing psycholinguistic units. And so, following the usage-based models of Bybee (1995), Langacker (2000), and Croft (2000), the question was how this child was able to "cut and paste" together her previously mastered linguistic constructions in order to create a novel utterance in a specific usage event. What was found by this procedure was:

- Of the 455 multi-word utterances produced, 78% were utterances that this child had said before during the previous 6 weeks of sampling - in exactly this same form as whole utterances. Many of these were utterance routines like *Thank-You, There-you-go*, etc., but many were simply frequently used multi-word utterances such as *Where's Daddy?*. 

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Another 18% of the target utterances were things the child had said before but with one minor change, that is, they consisted of an established utterance schema plus other linguistic material 'filled in' or 'added on'. For example, the child had said many scores of times previously *Where's X?,* but on the target tape she said *Where's the butter?*, which was new (*butter* having been said on 5 occasions previously in other linguistic contexts). As another example, the child said *I got one here,* which was new. But she had said *I got one 7 times previously,* and she had added *here* onto the end of utterances many scores of times previously.

Only 4% of this child's target utterances were different from things she had said before in more than one way. These mostly involved the combination of 'filling in' and 'adding on' to an established utterance schema. For example, the child said creatively *I want tissue lounge,* which seemingly derived from the utterance schema *I want OBJECT* (which she had said over 50 times previously), with a slotting in of the word *tissue* (which she had said 9 times previously in other contexts), and adding on of the word *lounge* (which she had said 3 times previously in other contexts).

There were exactly 3 utterances (less than one-half of one per cent) that could not be accounted for in a relatively straightforward application of this procedure, and 2 of these were heavily scaffolded by the immediate discourse context (i.e., the child took some of her utterance not from her stored linguistic experience but rather from her mother's immediately preceding speech).

It is thus clear that in the vast majority of cases, this child's creative utterances were based directly on things she had said before many times previously. Moreover, in the vast majority of cases, one of the pieces of language on which the child's creative utterance was based was what we called an utterance schema. Utterance schemas were things the child had said before as full utterances with some variation in one (or, infrequently, more than one) slot - such things as *Where's the X?, I wanna X, More X, It's a X, I'm X-ing it, Put X here, Mommy's X-ing it, Let's X it,* and so forth. Importantly, these utterance schemas were things that the child had said before, on average, an estimated 150 times during the previous six weeks, and the other language used in these creative utterances (e.g., to fill the slot) had been said before, on average in one or another context, an estimated 70 times during the previous six weeks (these estimations are aimed at reflecting the child's total experience as projected from our 10% sample). Further evidence for the psychological reality of these utterance schemas derives from the fact that there were virtually no insertions of linguistic material into previously invariant sequential strings within the schemas (e.g., the child never put adverbs or other modifiers into the middle of an established utterance schema) or substitutions of linguistic material into places that did not already have established slots. It is also important that there was almost perfect functional consistency across different uses of these utterance schemas; the child filled the slot with the same kind of linguistic item or phrase (e.g., an object word or a locative phrase) across the six week period of study.

The point is not that children are not creative with language; they are. But initially they are creative only in highly constrained ways. The general picture that emerges is thus as follows. When young children have something they want to say, they sometimes have a set expression readily available and so they simply
retrieve that expression from their stored linguistic experience. When they have no set expression readily available, they retrieve linguistic schemas and items that they have previously mastered (either in their own production or in their comprehension of other speakers) and then "cut and paste" them together as necessary for the communicative situation at hand - what I have called 'usage-based syntactic operations'. Perhaps the first choice in this creative process is an utterance schema which can be used to structure the communicative act as a whole, with other items being filled in or added on to this foundation (Tomasello, 1998a). It is important that in doing their cutting and pasting, children coordinate not just the linguistic forms involved but also the conventional communicative functions of these forms - as otherwise they would be speaking creative nonsense. It is also important that the linguistic structures being cut and pasted in these acts of linguistic communication are a variegated lot, including everything from single words to abstract categories to partially abstract utterance or phrasal schemas.

3. Some More Complex Constructions
The usage-based approach is also quite revealing in the case of some of children's more complex constructions a bit later in their development. For example, Diessel and Tomasello (in press) looked at 7 children's earliest utterances with sentential complements and found that virtually all of them were composed of a simple sentence schema that the child had already mastered combined with one of a delimited set of matrix verbs (see also Bloom 1992). These matrix verbs were of two types. First were epistemic verbs such as think and know. In almost all cases children used I think to indicate their own uncertainty about something, and they basically never used the verb think in anything but this first-person, present tense form; that is, there were virtually no examples of He thinks ..., She thinks ..., etc., virtually no examples of I don’t think ..., I can’t think ..., etc., and virtually no examples of I thought..., I didn't think ..., etc. And there were almost no uses with a complementizer (virtually no examples of I think that ...). It thus appears that for many young children I think is a relatively fixed phrase meaning something like Maybe. The child then pieces together this fixed phrase with a full sentence as a sort of evidential marker, but not as a “sentence embedding” as it is typically portrayed in more formal analyses. The second kind of matrix verbs are attention-getting verbs like Look and See in conjunction with full finite clauses. In this case, children use these 'matrix' verbs almost exclusively in imperative form (again almost no negations, no non-present tenses, no complementizers), suggesting again an item-based approach not involving syntactic embedding. Thus, when examined closely, children's earliest complex sentences look much less like adult sentential complements (which are used most often in written discourse) and much more like various kinds of 'pastiches' of various kinds of established item-based constructions.

A related study is that of Diessel and Tomasello (submitted) on relative clauses. Using a similar methodology, they found that the earliest relative clauses that English-speaking children learn occur in presentational constructions that are propositionally simple. They consist of a copular clause and a relative that usually includes an intransitive verb. Two types of this construction must be distinguished: (1) The regular presentational relative construction (PRC) in which
the relative clause is syntactically separated from the rest of the sentence, and (2) the amalgam construction in which the relative is conflated with the copular clause. Since the amalgam construction is usually the first relative construction that children learn and since the occurrence of this construction becomes very infrequent once the regular PRC has emerged, it can be seen as a precursor to the latter. Both presentational relative constructions express a single proposition, but since the amalgam construction does not include two separate full clauses, it is syntactically denser than the regular PRC. As the children of our study grow older, they begin to use more complex relative constructions in which a relative clause, including an intransitive or transitive verb, is attached to a noun in a full-fledged main clause. Such relative constructions contain two propositions expressed in main and subordinate clause. The whole development can therefore be seen as a process of clause expansion: Starting from the presentational amalgam construction, which expresses a single proposition in a structure that is not truly biclausal, children gradually learn the use of complex relative constructions in which two propositions are expressed in two separate full clauses.

The main point is that a usage-based account focused on specific item-based schemas that children learn and use can also account for complex sentences of a type that have traditionally been thought to require extremely abstract and complex syntactic structures. Again, the point is not that children cannot learn and use complex linguistic constructions, only that they do this on the basis of particular pieces of language that they hear and use repeatedly - with abstractions coming only slowly and gradually as children acquire more and more linguistic experience with the many expressions and constructions of their native language.

4. Some Thoughts on Process
If children are acquiring mainly item-based constructions early in development - and children acquiring different languages acquire different item-based constructions - an important part of the process must be some form of imitative learning. Imitation has been almost banished from the study of child language because it is most often defined as the child repeating verbatim what an adult has just said without understanding its meaning, and indeed this process very likely does not play a central role in language acquisition. But there are forms of social learning called cultural learning in which the learner understands the purpose or function of the behavior she is reproducing (Tomasello, Kruger, & Ratner 1993). Thus, Meltzoff (1995) found that 18-month-old infants attempted to reproduce the intentional action they saw an adult attempting to perform, even when that action was not carried through to completion, and Carpenter, Akhtar, and Tomasello (1998) found that 16-month-old infants attempted to reproduce an adult's intentional, goal-directed actions, but not her accidental actions. In the case of language, if they are to use a piece of language in an adult-like way, children must understand and reproduce both its surface linguistic form and its underlying communicative function - in the sense of using it in connection with the same communicative intention (Tomasello 1998b; 1999).

Cultural learning of this type works on multiple hierarchical levels simultaneously, and indeed it must work in this way if the child is to become creative with conventional, culturally based skills. As a nonlinguistic example, a
child may see an adult use a stapler and understand that his goal is to staple together two pieces of paper. In some cases, the child may understand also that the goal/function of placing the papers inside the stapler's jaws is to align them with the stapling mechanism inside the stapler, and that the goal/function of pressing down on the stapler is to eject the staple through the two papers - both of these sub-actions being in the service of the overall goal/function of attaching the two sheets of paper. To the extent that the child does not understand the sub-functions, she will be lost when she encounters some new stapler, for example, one whose stapling mechanism works differently (e.g., does not require pressing down). Only to the extent that the child understands the relevant sub-functions, will she be able to adapt to this new situation creatively (e.g., adjusting her behavior to effect the same outcome with the new stapling mechanism). The comparable linguistic example is that the child hears an adult say "I stapled your papers" and comprehends not only the utterance and its overall communicative intention, but also, for example, the word stapled and its communicative sub-function in the utterance (the contribution it is making to the utterance as a whole), along with the phrase your papers and its communicative sub-function in the utterance - with your serving a sub-function within that phrase. Again, only if the child performs some 'functionally based distributional analysis' of this type will she be able in the future to use these linguistic elements creatively in novel utterances.

Reconceptualized in this way to include intention reading, my claim is that cultural (imitative) learning is more important in language development, especially in the early stages, than has traditionally been recognized. This is clear in the data reviewed above, which revealed that before their third birthdays children use individual verbs and syntactic constructions in just the way they have heard and understood them being used - with only very limited abilities to go beyond what they have heard. Interestingly, there are two phenomena of child language acquisition that are often taken to be evidence against imitative learning, but which are actually evidence for it - if we look at exactly what children do and do not hear. First, many young children say things like "Her open it", an accusative subject which they supposedly have not heard from adults. But children hear things like "Let her open it" or "Help her open it" all the time, and so it is possible that when they say these things they are simply reproducing the end part of the utterances they have heard. Very telling is the fact that children almost never make the complementary error "Mary hit I" or "Jim kissed she" - the reason being that they never hear anything like this anywhere. A similar account can be given for some of the findings going under the general rubric of optional infinitives (Rice 1998). Children hear a very large number of nonfinite verbs right after nominative nouns, especially in questions such as "Should he open it?" and "Does she eat grapes?" The child might then later say, in partially imitative fashion: "He open it" and "She eat grapes".

It is also important that children seem to have special difficulties in going beyond what they have heard when they have heard it multiple times, that is, it is entrenched. Thus, Brooks, Tomasello, Lewis, and Dodson (1999) modeled the use of a number of fixed-transitivity English verbs for children from 3;5 to 8;0 years - verbs such as disappear that are exclusively intransitive and verbs such as hit that
are exclusively transitive. There were four pairs of verbs, one member of each pair typically learned early by children and used often by adults (and so presumably more entrenched) and one member of each pair typically learned later by children and used less frequently by adults (less entrenched). The four pairs were: come-arrive, take-remove, hit-strike, disappear-vanish (the first member of each pair being more entrenched). The finding was that, in the face of adult questions attempting to induce them to overgeneralize, children of all ages were less likely to overgeneralize the strongly entrenched verbs than the weakly entrenched verbs; that is, they were more likely to produce I arrived it than I comed it. This finding suggests not only that children say what they hear, but that the more they hear it the more it seems to them that this is the only way it can be said.

The imitative learning and entrenchment of particular linguistic forms cannot be the whole story of language acquisition, however, since children do at some point go beyond what they hear from adults and create novel yet canonical utterances. As noted above, they do this first by creating 'slots' in otherwise item-based schemas. It is not known precisely how they create these slots, but one possibility is that they observe in adult speech variation in that utterance position and so induce the slot on the basis of 'type frequency'. In general, in usage-based models the token frequency of an expression in the language learner's experience tends to entrench an expression - enabling the user to access and fluently use the expression as a whole (Langacker 1988; Krug 1998; Bybee & Schiebman 1999) - whereas the type frequency of an expression (i.e., the number of different forms in which the language learner experiences the expression or some element of the expression) determines the creative possibilities, or productivity, of the construction (Bybee 1985, 1995). Together, these two types of frequency - along with the corresponding child learning processes - may explain the ways in which young children acquire the use of specific linguistic expressions in specific communicative contexts and then generalize these expressions to new contexts based on various kinds of type variations they hear - including everything from type variation in a single slot to type variation in all of the constituents of a construction. The extent of type variation needed for different kinds of productivity is not known at this time, and indeed after a certain point in development it may be that type variation in the slots of constructions becomes less important as these slots comes to be more precisely defined functionally.

Another possibility - not mutually exclusive but rather complementary to the above - is that abstract constructions are created by a relational mapping across different verb island constructions (Gentner & Markman 1997). For example, in English the several verb island constructions that children have with the verbs give, tell, show, send, and so forth, all share a 'transfer' meaning and they all appear in a structure: NP+V+NP+NP (identified by the appropriate morphology on NPs and VPs). The specific hypothesis is thus that children make constructional analogies based on similarities of both form and function: two utterances or constructions are analogous if a "good" structure mapping is found both on the level of linguistic form and on the level of communicative function. Precisely how this might be done is not known at this time, but there are some proposals that a key element in the process might be some kind of "critical mass"
of exemplars, to give children sufficient raw material from which to construct their abstractions (Marchman & Bates 1994).

In either case, the main point is that young children begin by imitatively learning specific pieces of language in order to express their communicative intentions, for example, in holophrases and other fixed expressions. As they attempt to comprehend and reproduce the utterances produced by mature speakers - along with the internal constituents of those utterances - they come to discern certain patterns of language use (including patterns of token and type frequency), and these patterns lead them to construct a number of different kinds of (at first very local) linguistic categories and schemas. As with all kinds of categories and schemas in cognitive development, the conceptual "glue" that holds them together is function; children categorize together things that do the same thing (Mandler 1997). In this case, children understand as instances of the same kind of linguistic units those that serve 'the same' or 'similar' communicative functions in utterances.

5. Conclusion

If grammatical structures do not come directly from the human genome, as the above-reported data suggest they do not, and if children do not invent them de novo, as they clearly can not, then it is legitimate to ask: Where do grammatical structures come from? The answer is that, in the first instance, they come from processes of grammaticalization in language history. That is to say, at some point in human evolution, Homo sapiens evolved the ability to communicate with one another symbolically (Deacon 1998). When human beings communicate symbolically with one another in extended discourse interactions, the stringing together of symbols begins to become grammaticalized, for example, content words such as nouns and verbs become function words such as prepositions and auxiliaries, and loosely concatenated symbols acquire syntactic relationships involving constituency and dependency. These transformations of linguistic structure occur as a result of social-interactive processes in which (i) speakers try to abbreviate linguistic expression as much as they can, and (ii) listeners try to make sure that speakers do not go so far in this direction that the message becomes incomprehensible. Grammaticalization processes are well-attested in the written records of numerous languages in their relatively recent pasts, and it is a reasonable assumption that the same processes were at work in the origin and early evolution of language, turning loosely organized sequences of single symbols into grammaticized linguistic constructions (Traugott & Heine 1991; Givón 1995; Slobin, 1997)

But grammaticalization by itself is not enough because it does not account for the abstractness of linguistic structures. Abstractness, as Chomsky recognized in even his earliest writings, must be contributed by the minds of individual children as they acquire the use of particular pieces of particular languages. It is possible - albeit very difficult - to imagine that children make this contribution by simply linking an innate universal grammar with the particular structures of the particular language they are learning. However, it is also possible - and more in accord with recent data - to imagine that children make this contribution in more extended developmental processes in which they apply their general cognitive, social-cognitive, and vocal-auditory processing skills to the historical products of
grammaticalization (Tomasello 1995, 1998c, 1999). Overall, then, we may hypothesize that human language originated ultimately from a species-unique biological adaptation for symbolic communication, but the actual grammatical structures of modern languages were humanly created through processes of grammaticalization during particular cultural histories, and through processes of cultural learning, schema formation, and structure combining during particular human ontogenies.

The study of language acquisition has always tagged along behind models from Linguistics - because to study how children acquire something we should first know what that something is. The new usage-based models of Cognitive and Functional Linguistics offer some exciting new perspectives for developmentalists because they are concerned with the actual psychological processes by means of which individuals comprehend and produce utterances. But cognitive and functional linguists have something to learn from developmental psycholinguists as well. If we are interested in people's "stored linguistic experience", and how they use that experience in acts of linguistic communication, it would seem relevant to investigate systematically the processes by which linguistic experience is built up and used in human ontology.

6. References


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A Usage-Based Approach to Child Language Acquisition


A Usage-Based Approach to Child Language Acquisition


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Yaka Nasal Harmony: Spreading or Segmental Correspondence?

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0. Introduction
This paper examines a nasal harmony among consonants (Cs) in Yaka, a Bantu language spoken in Zaire. Two key properties of the phenomenon are observed:

(1) i. Nasality agreement can occur between segments at a distance.
    ii. Nasality agreement preferentially occurs between similar Cs.

I argue that this kind of nasal harmony comes about through a correspondence relation between Cs in a word rather than resulting from feature spreading. This proposal will be important in explaining the characteristics in (1) and also the neutrality of ‘prenasal’ NC complexes in the language. From a broader perspective, this approach has the potential to extend to other segmental harmonies that display similar characterizing properties (Walker 1999, to appear, Rose & Walker in prep.).

The analysis is couched in Optimality Theory (OT; Prince & Smolensky 1993). The paper is organized as follows. In §1 I present data illustrating Yaka nasal harmony. In §2 I bring evidence to bear on the question whether the pattern arises through correspondence or spreading, and I diagnose it as the former. §3 lays out a theoretical overview of the correspondence approach to long-distance harmony. In §4 I develop the details of the Yaka analysis, and §5 gives the conclusion.

1. Yaka Consonantal Nasal Harmony
Yaka presents a consonantal nasal harmony (CNH) discussed by Hyman (1995), whereby a nasal stop induces nasalization of voiced Cs occurring at any distance to its right within the stem. CNH produces segmental alternations, as illustrated with the perfective suffix -idi/ in (2) (vowel alternations result from an independent height harmony). Observe that vowels (Vs) and voiceless stops can occur between the stops that agree in nasality, but these intervening segments remain unaffected.

(2) yán-ini ‘to cry out’
kém-ene ‘to groan’
bún-ini ‘to break wind’
hámük-ini ‘to give way’
nútük-ini ‘to slant’
místük-ini ‘to sulk’

cf. yád-idi ‘to spread’
kéb-ede ‘to deforest’
búd-idi ‘to break’

* For useful comments on this research, thanks to Dani Byrd, Jack Hawkins, Larry Hyman, Maryellen MacDonald, John Ohala, Jaye Padgett, Sharon Rose, and BLS audience members.
Rachel Walker

In Yaka, the phoneme /d/ is realized as [l] when oral, except after [n] or before [i]. For ease of exposition, I write this segment as [d] in all cases where it is oral. The potential for interaction between nasals and [l] will nevertheless be examined later.

As seen in (3), NC complexes that are composed of nasal and voiced oral stop elements neither trigger nor block nasality agreement.

(3) bimbidi ‘to embrace’
kúndidi ‘to bury’
táangidi ‘to read, compute’
náangini ‘to last’

Yaka NC complexes have been referred to on occasion as prenasalized stops, but I will argue below that they actually have the status of NC clusters, and that this structure is connected to their neutrality.

CNH that targets voiced non-continuants across Vs is widespread in Bantu (Greenberg 1951). The Yaka-type pattern, where the triggering nasal can occur at any distance in the word, is also found in Kikongo (Ao 1991, Odden 1994, Piggott 1996). CNH displays two main characteristics that must be addressed in the analysis. First is the potential for action at a distance: the interactions are non-local in the sense that the Cs agreeing for [+nasal] are not root-adjacent, and intervening Vs and Cs can occur without undergoing or blocking nasality agreement. Second, CNH presents a similarity effect, that is, the nasalization preferentially targets segments that are similar to the nasal trigger, namely, voiced Cs. Segments that are considerably different, i.e. Vs and voiceless Cs, do not participate in the harmony. (The neutrality of NC complexes will also be examined in this connection in §4.)

2. Spreading or Correspondence?

Before developing the details of analysis, we must first diagnose the phonological mechanism that brings about CNH. Two common means of producing featural agreement are feature spreading and segmental correspondence. Previous accounts of CNH have assumed a spreading approach, whereby [+nasal] is linked across the agreeing segments. Subsegmental spreading accounts have proposed that [+nasal] is linked at some site subsidiary to the root, as in (4a) (Ao 1991, Odden 1994, Hyman 1995). Alternatively, Piggott (1996) proposes a suprasegmental spreading, where [+nasal] spreads at the level of a syllable-organizing node that he calls the harmony foot (H-Ft)—a unit distinct from the stress foot. This structure is shown in (4b) (with a Kikongo form). In contrast, under a correspondence approach, CNH would arise via a correspondence relation that is established between similar segments, as in (4c). A requirement of identity for [nasal] specifications in corresponding Cs produces agreement—no long-distance linkage across segments is posited. I will argue that it is the latter mechanism that gives rise to CNH.

(4) a. Subseg. spreading  b. Supraseg. spreading  c. Segment correspondence
  \[
  y a n i n i
  \]
  [+nasal]
  [H-Ft]
  \[
  \sigma
  \]
  \[
  k i n u n a
  \]
  y a nαi nαi
  [H-Ft]
  [H-Ft]
  \[
  [\sigma]
  \[
  [\sigma]
  \[
  [+nasal]
  [+nasal]
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Let us begin by considering support for the correspondence mechanism underlying CNH. In other recent research on consonantal harmony, Walker (1999, to appear) argues that correspondence is at work in a pattern of voicing agreement between obstruents that are not root-adjacent in Kera and Ngbaka. Interestingly, the long distance voicing harmony also displays a similarity effect such that the more similar a segment is to the trigger, the more likely it is to be targeted, and segments that are substantially dissimilar from the trigger pattern as neutral. Support for a correspondence mechanism in this kind of harmony is noted on three fronts. First, correspondence relations are typically not limited to root-adjacent segments. For example, in reduplication, corresponding segments are often separated by one or more intervening segments, as in [RED-kọlọ] -> [k₁,ɔ₂],a₄-k₁,ɔ₂],a₄,t] ‘spoon’ (West Tarangan; Spaelti 1997). Further, though in reduplicative correspondence segments are most often copied starting at the edge at which affixation takes place (producing a kind of locality effect), various studies of reduplication have shown that edge-anchoring is violable (Gafos 1996, 1998, Spaelti 1997, Walker 1998). The second point is that correspondence explains the lack of effect on intervening segments. As seen in (4c), nasal identity is checked in corresponding stops. Since no linkage of [+nasal] is posited between the stops, the neutrality of the intervening V is straightforward. Third, the correspondence approach offers the potential for explanation of the similarity effect. In the voicing harmony study, Walker proposes that a correspondence relation is established because the segments are similar. I will argue below that in the case of CNH, this point also has potential to bring understanding to the neutrality of NC complexes.

Let us now to the spreading alternatives in (4a-b). Though the spreading-based approaches represented important developments in research on long-distance segmental interactions, their status in the theory has since grown to be questionable on several counts. A growing body of work supports a theory of spreading under which features spread only between root-adjacent segments. A theory that admits representations in which feature linkage may gap across segments is argued to be too permissive—it predicts a range of feature spreading phenomena that are simply not borne out (Padgett 1995a, Ní Chiosáin & Padgett to appear, Walker 1998, cf. Gafos 1996). In connection with this notion of locality, spreading is viewed as the result of extending a feature span, where features represent unitary and continuous entities. As discussed by the above researchers, this understanding of spreading has foundation in concepts of Articulatory Phonology (Browman & Goldstein 1986). Extending a continuous feature cannot produce an outcome in which the span of the spreading property contains interruptions; hence it must obey root-level locality.

Another problematic aspect arises from the underspecification or other representational inertness that must be assumed for neutral NC elements under spreading. The structure in (5) illustrates an example discussed by Hyman (1995), where neutrality of NC complexes is obtained via underspecification of [+nasal] and the target node in these segments. However, this must provoke the question why the target node would be underspecified in [nd] but not [n] or [d] alone.

(5) n V nd V d 
    +nasal
More generally, Hyman points out that several ad hoc representational solutions are capable of achieving the neutrality of NC. What remains unanswered by these accounts is the important question of why NC patterns as neutral.

Spreading at a suprasegmental level also engenders concerns. In order for this approach to be feasible, a number of assumptions must be adopted that complicate aspects of the theory. First, it must be allowed that feature spreading can take place at more than one structural level, either segmental or prosodic. This moves beyond the more restrictive assumption that features spread only within or below the root node, where they are located in the segment structure. Hence, the account is subject to many of the overgeneration objections that have been raised in connection to gapping of feature linkage. A related point arises in regard to the targets of CNH. The suprasegmental analysis attributes the neutrality of Vs to Structure Preservation—nasal Vs do not occur underlyingly in the language (Piggott 1996: 156). However, this account misses the similarity generalization, rendering the cross-linguistic limitation of CNH to voiced Cs accidental. Finally, this approach introduces a new functional foot-type. If suprasegmental spreading were obviated by the independently-motivated correspondence mechanism for featural agreement, then the set of foot-types needed in the theory would be accordingly simplified. In what follows I thus pursue a correspondence analysis of CNH.

3. Long-Distance Segment Agreement via Correspondence
I formalize the analysis in OT, along with the Correspondence model of faithfulness, as elaborated by McCarthy & Prince (1995). I assume a basic familiarity with the formalisms and underpinnings of these theories.

At the core of the present proposal is the claim that correspondence can hold between segments in the output of a word (Walker 1999, to appear; for related proposals see Suzuki 1999, Zuraw 2000, cf. Yip to appear). In general, correspondence is established between structures that are recognized as related. Familiar examples of corresponding structures include input-output, base-reduplicant, and morphologically-related outputs. In the case at hand, the correspondence relation is suggested to stem from similarity, in other words, segments that are recognized as alike in many ways are prone to be identified as related, and thus correspondence is established between them.

As discussed by Walker, the notion that similar segments in an output may be identified as related, and hence interact, has basis in the processing of phonological structure. Psycholinguistic studies of the phonological encoding and production of words reveal that the production of a given C activates or primes other Cs that share a large number of features. The effects are evidenced in speech errors and tongue twisters, whereby Cs that are identical in all but one feature are found to be more likely to induce slips of the tongue (MacKay 1970, Fromkin 1971, Shattuck-Hufnagel & Klatt 1979, among others). It is observed that similar but different sounds frequently shift to identical ones; examples include *shoes and socks* pronounced as *shoes and shocks* and the past five years as *past five* (Shattuck-Hufnagel 1987). (Note also that a recent study by Pouplier et al. (1999) finds evidence that speech errors can occur at the subsegmental level, i.e. at the gestural or featural level.) Other work has identified gradient perceived similarity as a factor that contributes to the potential for interaction between segments (see Frisch 1996, Frisch et al. 1997 and citations therein). Taken together, this research suggests that the occurrence of segments that are only slightly different in an utterance presents
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production and perception difficulties, a point reflected in spreading activation models of speech processing (Stemberger 1985, Dell 1986), and it provides support for the claim that speakers construct a relation between similar segments.

I propose that the formal actualization of such relations arises via a set of violable constraints in the grammar. The schema for a constraint requiring that correspondence be established between Cs in an output is given in (6)—generalized over all Cs—the matter of similarity will be addressed presently.

(6) Consonantonal Correspondence Constraint: CORR-C₁↔C₂
Given an output string of segments S, and consonants C₁∈S and C₂∈S, where C₂ follows C₁ in the sequence of segments in S, then a relation is established from C₁ to C₂, that is, C₁ and C₂ are correspondents of one another.

The above formulation makes reference to ordering, since the nasality interaction is directional in Yaka. However, some other cases of long distance agreement could be handled by a non-directional version of the constraint (Walker to appear).

We have noted that the degree of similarity between Cs is a key factor in triggering a relation between them. I propose to implement this formally by arraying CORR-C↔C constraints in a hierarchy such that the more similar the pair of Cs, the higher ranked the constraint requiring that they be in correspondence. The relevant portion of the hierarchy for CNH among stops is given in (7).

(7) Relevant portion of similarity-based Correspondence Hierarchy:
CORR-N₁↔N₂ >> CORR-N₁↔D₂ >> CORR-N₁↔B₂

The constraints are interpreted as follows. CORR-N₁↔N₂ enforces correspondence between any pair of identical nasals ([n...n], [m...m], etc.). CORR-N₁↔D₂ holds over the superset of voiced stops that match in place, i.e. ones that are at least as similar as [n] and [d] ([n...d], [b...m], [n...n], etc.). CORR-N₁↔B₂ expands to any pair of voiced stops.

Let us now consider how the constraints in (7) will be evaluated with respect to a hypothetical demonstration form [nidi]. As represented in (8), the standard Faith-IO correspondence constraints will hold between the input and output. Within the output, CORR-C↔C constraints can cause a relation to be established between the two stops. Faith-CC constraints will enforce identity between these segments.

(8) Consonantonal Correspondence model:
Input   /nidi/
\downarrow
Output  [ nidi ]
\leftrightarrow

Faith-IO

Faith-CC

The relevant Faith-CC constraint is given in (9). It requires that if a C in the output is [+nasal], its correspondent C must also be [+nasal].

(9) IDENT-CC(∪nasal)
Let C₁ and C₂ be consonants in the output, and let there be a correspondence relation from C₁ to C₂. If C₁ is [+nasal], then C₂ is [+nasal].

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The tableau in (10) illustrates the violations incurred by various candidates (constraints are unranked here). Subscripts annotate CC-correspondence. I assume in this tableau and henceforth that IO relations in the candidates shown are such that segments with matching positions in the input and output strings are in correspondence.

(10) Consonantal correspondence in different output candidates

<table>
<thead>
<tr>
<th>/nidi/</th>
<th>IDENT-CC (+nas)</th>
<th>IDENT-IO (-nas)</th>
<th>CORR-N₁→N₂</th>
<th>CORR-N₁→D₂</th>
<th>CORR-N₁→B₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. nαidβl</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. nαidαl</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>c. nαinαl</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>d. nαinβl</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<td>*</td>
</tr>
</tbody>
</table>

Candidates (10a-b) do not display CNH. In (a) the Cs are not in correspondence, violating CORR-N₁→D₂, and by implication, CORR-N₁→B₂ as well. In (b), the Cs are correspondents, but they fail to agree in nasality, violating IDENT-CC(+nas). Candidate (c) exemplifies the CNH outcome: correspondence is established between the two Cs, and they obey IDENT-CC(+nas). This candidate violates IDENT-IO(-nas), which requires that if a segment in the input is [-nasal], its correspondent in the output must also be [-nasal]. Candidate (d) represents an instance of sporadic change. The second C in (d) becomes [+nasal], but without being in correspondence with the first nasal. This unmotivated introduction of nasalization is sub-optimal under any ranking of these constraints.

4. Analysis of CNH in Yaka

I turn now to the details of the rankings for CNH in Yaka. The rankings in question must achieve an outcome in which voiced stops become nasal when preceded by a nasal in the stem. Since the requirement of identity for [+nasal] between corresponding stops in the output has the capacity to override [-nasal] identity with the input, IDENT-CC(+nas) must dominate IDENT-IO(-nas), as shown in (11). I assume that MAX-IO outranks IDENT-IO(-nas) to prevent deletion of Cs.

(11) IDENT-CC(+nas) >> IDENT-IO(-nas)

<table>
<thead>
<tr>
<th>/yan-idi/</th>
<th>IDENT-CC(+nas)</th>
<th>IDENT-IO(-nas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. eαyanαinαl</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. yanαidαl</td>
<td></td>
<td>*!</td>
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</table>

Next, since all voiced Cs are subject to CNH, the constraint requiring correspondence between any pair of voiced stops must also dominate IDENT-IO(-nas) in order to compel a relation between voiced Cs in the output. The ranking of CORR-N₁→B₂ over IDENT-IO(-nas) is illustrated in (12). IDENT-IO(voice) is also assumed to outrank IDENT-IO(-nas) to rule out a devoicing alternative, and the preservation of input place specifications indicates IDENT-IO(Place) >> IDENT-CC (Place). Note that the occurrence of vowel harmony is assumed in the output candidates here.
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(12) \[ \text{CORR-}N_1 \leftrightarrow B_2 \gg \text{IDENT-IO}(-\text{nas}) \]

<table>
<thead>
<tr>
<th>/kem-idi/</th>
<th>IDENT-CC (+nas)</th>
<th>CORR-(N_1 \leftrightarrow N_2)</th>
<th>CORR-(N_1 \leftrightarrow D_2)</th>
<th>CORR-(N_1 \leftrightarrow B_2)</th>
<th>IDENT-IO (-nas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kem(\alpha)ed(\beta)e</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. (\text{ek}^\text{\textit{e}}) kem(\alpha)ed(\alpha)e</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. kem(\alpha)ed(\alpha)e</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The winner in (12) is (b), in which the voiced stops correspond and satisfy IDENT-CC(+nas). The alternative candidates lose either because the voiced stops do not correspond (a) or because they correspond but violate CC nasal identity (c).

The tableau in (13) shows an example where this ranking applies to a schematic input form that contains a voiceless stop intervening between a nasal and a suffix containing /d/. The voiceless stop patterns as neutral, because it is not sufficiently similar to the nasal to be subject to CORR-C\(\leftrightarrow\)C constraints. As a result, in the optimal output (a), /n/ and /\textit{t}/ are not correspondents, and there is no nasality agreement between them. The alternatives in (b) and (c) establish correspondence between /n/ and /\textit{t}/. However, since there is no constraint to drive this relation, each incurs a superset of the violations incurred by (a). Notice that the lack of correspondence between /n/ and /\textit{t}/ in (a) does not prevent nasal agreement from holding between /n/ and suffixal /	extit{d}/. Hence the long-distance interaction is straightforward.

(13) Voiceless Cs do not participate in nasal agreement:

<table>
<thead>
<tr>
<th>/nVt-VdV/</th>
<th>IDENT-CC (+nas)</th>
<th>CORR-(N_1 \leftrightarrow N_2)</th>
<th>CORR-(N_1 \leftrightarrow D_2)</th>
<th>CORR-(N_1 \leftrightarrow B_2)</th>
<th>IDENT-IO (-nas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (\text{ek}^\text{\textit{e}}) n(\alpha)Vt(\beta)VN(\alpha)V</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. n(\alpha)Vn(\alpha)VN(\alpha)V</td>
<td>**!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. n(\alpha)Vt(\alpha)VN(\alpha)V</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

Recall that the pattern of CNH is such that nasals only trigger nasalization in voiced Cs to their right. This outcome is illustrated in (14) with an input in which a nasal is flanked by syllables containing oral voiced stops. The directionality of CNH comes about from the direction of correspondence mapping. The CORR-C\(\leftrightarrow\)C formulation in (6) states that a relation is established from \(C_1\) to \(C_2\), where \(C_2\) follows \(C_1\) in the sequence of segments. This means that in a form \([C_1VC_2VC_3V]\), the following relations hold: \(C_1\sim C_2\), \(C_1\sim C_3\), and \(C_2\sim C_3\). These match the relations determined by the relevant CORR-C\(\leftrightarrow\)C constraints in the output in (14): all of the voiced stops stand in a left-to-right relation. Because of the directionality of the dependency, IDENT-CC(+nas) requires that if the first C of a related pair is [+nasal], the second one must be [+nasal], but not vice versa, i.e. in evaluating the pair of Cs in \([b\alpha un\alpha ...]\), IDENT-CC(+nas) is satisfied, since \([b]\) is [-nasal].

In the optimal output in (a), only the voiced stop that is preceded by a nasal, becomes nasal itself. In (b) the first voiced stop also becomes nasal, but this candidate is ruled out on the basis of an extra IDENT-IO(-nas) violation. Candidate (c) displays denasalization. This candidate is eliminated by ranking IDENT-IO(+nas) over IDENT-IO(-nas). The alternatives in (d) and (e) do not establish
correspondence between all voiced stops. These lose on the basis of CORR-C↔C violations.\(^1\)

(14) Nasals trigger nasalization only in succeeding voiced stops

<table>
<thead>
<tr>
<th>/bun-idi/</th>
<th>IDENT-IO (+nas)</th>
<th>IDENT-CC (+nas)</th>
<th>CORR-N₁↔N₂</th>
<th>CORR-N₁↔D₂</th>
<th>CORR-N₁↔B₂</th>
<th>IDENT-IO (-nas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (\nu)un_a(\alpha)i</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. (\nu)un_a(\alpha)i</td>
<td></td>
<td></td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (\nu)ud(\alpha)i(\alpha)i</td>
<td>*!</td>
<td></td>
<td></td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>d. (\nu)un_b(\alpha)i(\alpha)i</td>
<td></td>
<td></td>
<td></td>
<td><em>↑</em></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>e. (\nu)un_b(\alpha)i(\alpha)i</td>
<td></td>
<td></td>
<td></td>
<td><em>↑</em></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

For a complete picture of CNH in Yaka, it should be noted that Hyman’s study revealed that nasal agreement targets not just voiced stops, but also approximant Cs (1995: 16; see Piggott 1996 for a related observation regarding CNH in Kikongo). This point had previously escaped notice because voiced Cs besides [d] (and its allophones) do not occur in the relevant suffixes, so other alternations are not seen. However, on the basis of an electronic dictionary search, Hyman established the distributional generalization that the voiced Cs [d/I, b, w, y] do not appear after nasals in a stem. This pattern suggests that a constraint requiring correspondence between nasal and approximant Cs should be added to the portion of the CORR-C↔C hierarchy that is relevant for nasals. The constraint in question, which I will refer to as CORR-N₁↔L₂, must dominate IDENT-IO(-nas). I tentatively posit that CORR-N₁↔L₂ is situated alongside CORR-N₁↔B₂ in the hierarchy.

The range of targets identified for CNH is consistent with the similarity basis proposed to underlie C-correspondence. The acoustic properties of nasals and approximants are similar in their intensity and in displaying well-defined formant structures. This similarity has been argued elsewhere to produce phonological effects, for example, the auditory similarity between [n] and [l] has been suggested to induce the substitution of [n] for /l/ in fortition environments in Korean and Cuna (Flemmng 1995). On the other hand, voiced oral stops are close to nasals in their articulatory configuration. They also share the acoustic correlates of voicing, and produce similar formant transitions in neighboring Vs. The resulting similarity scaling is represented in (15). Nasal stops are similar to both approximant Cs and voiced stops, so these are the segments with which they are expected to stand in correspondence. Voiceless Cs and Vs are substantially different, hence they are not expected to participate in CC correspondence-based interactions with nasals.\(^2\)

(15) Similarity scaling

Vowel  Approximant C  ↔  Nasal Stop  ↔  Voiced Stop  ↔  Voiceless C

---

\(^1\) The precedence of [+nasal] over [-nasal] (attributed to IDENT-IO(+nas) >> IDENT-IO(-nas)) might be obtained via a privative view of [nasal] (Steriade 1995). I leave this matter for further research.

\(^2\) It is interesting to note that Nbgaka (Thomas 1963) presents an example of CNH that exacts a stricter similarity requirement than Yaka. In Nbgaka, CNH is restricted to homorganic stops. This language is distinguished from Yaka by ranking IDENT-IO(-nas) at the point between the CORR-C↔C constraint for homorganic stops and the CORR-C↔C constraints for heterorganic stops and approximants, thereby preventing nasalization of the latter segments.
Yaka Nasal Harmony: Spreading or Correspondence?

Before closing the analysis of Yaka, it is necessary to address one further matter, namely, the status of 'prenasal' NC complexes. In what follows, I diagnose NC as a segmental cluster in Yaka, and argue that this structure renders them sufficiently dissimilar from simple stops to cause them to behave neutral in CNH.

Padgett (1995b) examines the question of the phonological structure of 'prenasalized' NCs in general. Drawing on support from various sources, he argues that they correspond to a two-root structure, as in (16), rather than a single segment containing [+nasal] and [-nasal] (Sagey 1986). Any special properties of prenasalized NCs are suggested to stem from their potential to syllabify as an onset.

(16) n \ d  
   Root  Root  
   / \ /  
  [+nas] Place

Studies of Bantu have confirmed that there is good evidence that prenasalized NCs consist of two segments. Support from phonological patterning is reviewed by Padgett (1995b) and Piggott (1996). For example, Clements (1986) argues that prenasalized NCs in Luganda are demonstrably clusters underlyingly. See also Herbert (1986). The presence of a nasal feature in the structure is verified by NC triggering phonological nasalization of Vs in some languages. Browman & Goldstein (1986) bring an instrumental study to bear on the issue. They compare timing in English NC clusters with prenasal NCs in Chaga and find no systematic difference. They conclude that the distinction is purely distributional in these cases.

In addition to these more general arguments, there is distributional evidence from Yaka for the two-root representation. Although nasals and voiced oral stops can occur both initially and medially in stems, NC complexes occur independently only in medial position. NC is found initially only when a nasal from a preceding prefix is structurally present (e.g. 1 sg. prefix, 9/10 prefix; Hyman 1995). If prenasals were unitary segments, this distributional gap would be unexpected. The cluster representation of NC is also supported by its neutrality in Yaka nasal agreement. If medial NC is syllabified across two syllables, then its neutrality can be attributed to a syllable role identity effect, that is, the failure of NC to participate in CNH can be understood as resulting from its place-linked heterosyllabic status in contrast to the monosegmental occurrences of nasals and voiced stops in onsets.

(Note that analysts of CNH in Kikongo, who have addressed the representation of NC in that language, assume a two-root structure also; Ao 1991, Piggott 1996.)

The relevant constraint is given in (17) (McCarthy & Prince 1993, applications

3 A monosegmental structure in which prenasalization is manifested only as a phonetic realization of voicing or sonorancy is discussed by Piggott (1992) and acknowledged in Padgett's work. These segments are not of the type with which we are concerned here.

4 Recall that prefix material stands outside of the stem domain, so the nasal in a word onset NC is not expected to trigger CNH.

5 Hyman also considers the two-root structure for Yaka. He notes that since a V length opposition can be maintained before NC, it must be posited that the nasal is non-moraic (1995: 20). A conceivable alternative is to view NC complexes in Yaka as represented by two root nodes both syllabified into an onset. This would explain the lack of V shortening before NC, and the neutrality of NC could then be analyzed as a result of the contrast in the structural role of place-linked clusters versus simple onsets. The viability of this alternative requires further research.
include Gafos 1996, 1998, Suzuki 1999). The preference for a relation to be established between segments with matching syllabic positions has correlates in the psycholinguistic literature: segments with the same structural role are found to be more likely to participate in speech errors (Shattuck-Hufnagel 1983, 1987).

(17) \( \sigma \)-ROLE-CC: Corresponding consonants must have identical syllable roles.

The analysis is illustrated in (18) with a schematic form. \( \sigma \)-ROLE-CC is top-ranked. Since each segment in the NC cluster has at least a portion of its content affiliated with a coda, neither corresponds with the non-cluster Cs occupying onsets in the optimal output (a). As a result, [nd] behaves neutral and simple /h/ and /d/ participate in CNH. The alternatives in (b-c), where an NC segment corresponds with a non-cluster stop, are ruled out by \( \sigma \)-ROLE (one * for each violating C-pair).

(18) NC does not participate in nasal agreement:

<table>
<thead>
<tr>
<th>/nVnd -VdV/</th>
<th>IDENT-CC (+nas)</th>
<th>( \sigma )-ROLE-CC</th>
<th>CORR-( N_1 \leftrightarrow N_2 )</th>
<th>CORR-( N_1 \leftrightarrow D_2 )</th>
<th>CORR-( N_1 \leftrightarrow B_2 )</th>
<th>IDENT-IO (-nas)</th>
</tr>
</thead>
</table>
| a. \( \sigma \sigma \sigma \sigma \)  
\( n_\alpha Vn_\beta d_\gamma Vn_\alpha V \)  
Place | \* \* | \* \* \* \* \* | \* \* \* \* \* | \* |
| b. \( \sigma \sigma \sigma \sigma \)  
\( n_\alpha Vn_\beta d_\gamma Vn_\alpha V \)  
Place | \* \* \* | \* \* \* \* \* | \* \* \* \* \* | \* |
| c. \( \sigma \sigma \sigma \sigma \)  
\( n_\alpha Vn_\beta n_\gamma Vn_\alpha V \)  
Place | \* \* \* \* \* \* \* | \* \* \* \* \* \* \* \* \* | \* \* \* \* \* \* \* \* \* | \* \* |

A ranking summary for CNH in Yaka is given in (19):

(19) a. CNH targets voiced Cs: ID-IO\(+nas\), ID-CC\(+nas\), CORR-\( N_1 \leftrightarrow N_2 \) \( \gg \) CORR-\( N_1 \leftrightarrow D_2 \) \( \gg \) CORR-\( N_1 \leftrightarrow B_2 \), CORR-\( N_1 \leftrightarrow L_2 \) \( \gg \) ID-IO\(-nas\)
b. NC is neutral: \( \sigma \)-ROLE-CC \( \gg \) CORR-\( N_1 \leftrightarrow N_2 \)

5. Conclusion
The result that I have argued for here is that Yaka CNH is the product of a correspondence relation between segments in the output. This analysis brings explanation to its signature properties: the long distance interaction, the preferential targeting of similar segments, and the neutrality of voiceless Cs, Vs, and NC. From a wider standpoint, this work distinguishes two sources of featural agreement: spreading and correspondence. In investigating a given agreement phenomenon, locality and similarity effects can be utilized as diagnostics. For example, Walker (1998) examines variations in a kind of nasal harmony that always includes Vs among its set of targets. Since the trigger nasal stop is quite different

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from Vs, this pattern is not consistent with correspondence. In these instances, Walker argues that the basis for preferred targets is their compatibility with superimposed nasalization. Further, it is observed that nasalization in these patterns propagates only among root-adjacent segments. Both of these properties are consistent with spreading. In contrast, the long distance interaction and similarity effect seen in the nasal agreement studied here is diagnostic of correspondence.

The findings of the present work invite re-examination of other long-distance interactions. Research under way by Rose & Walker (in prep.) is directed towards exploring a typology of C agreement at a distance. A central issue is understanding why only certain features display agreement at a distance; in particular, major C-place agreement at a distance is not observed. Continued investigation into the psycholinguistic factors involved may prove fruitful in this direction.

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Reconstructing the History of AAVE: New Data on an Old Theme

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0. Introduction*
Despite intense scrutiny over the past several decades, the history of African American Vernacular English (AAVE) remains cloaked in controversy. Opinion on the genesis and earlier development of AAVE has now endured several “consensus” positions, only to return to a state of dispute. In the 1950s and early 1960s the Anglicist hypothesis—that the speech of African Americans derived directly from British-based dialects—was commonly accepted by dialectologists (McDavid and McDavid 1951), but it was replaced in the 1970s by the widespread acceptance of the creolist hypothesis, which posited AAVE to be rooted historically in an expansive creole found in the African diaspora (Bailey 1965, Stewart 1967, Dillard 1972). However, since that period, new corpora have emerged to challenge the creolist hypothesis, providing a basis for the resurgence of a modified version of the Anglicist position (Montgomery, Fuller, and DeMarse 1993, Mufwene 1996, Poplack 1999). But the neo-Anglicist position has hardly become a consensus one, as disputes remain over the nature of written and spoken data (e.g. Hannah 1997, Sutcliffe forthcoming, Wolfram 2000), the language contact situation involving earlier African Americans (Winford 1997, 1998, forthcoming), and the sociohistorical circumstances contextualizing earlier AAVE (Mufwene 1996, Rickford 1997, Singler 1998a,b). If nothing else, the shifting positions on its origin and development should caution us to go slow in arriving at definitive conclusions about the earlier status of AAVE.

One of the most important types of evidence for the neo-Anglicist position comes from data collected in transplant enclave communities, that is, groups of African Americans who left the United States before the Civil War and subsequently lived in relative isolation in locations such as Samaná in the Dominican Republic (Poplack & Sankoff 1987, Poplack & Tagliamonte 1989,

*Research reported here was funded by National Science Foundation Grant BCS 99-10224 and the William C. Friday Endowment at North Carolina State University. I am indebted to Becky Childs and Elaine Green for extracting data for several of the variables discussed here as well as for their tireless fieldwork. I am also grateful to Erik Thomas, who conducted the acoustic analyses of vowels reported here.
Poplack 1999) and Nova Scotia in Canada (Poplack & Tagliamonte 1991, Poplack 1999). This study considers a different but equally important enclave community, the case of a small, long-standing community of African Americans and Anglo Americans who have lived together in relative isolation within the United States for almost three centuries. Although expatriate enclave communities might, at first glance, seem to hold more potential for examining the state of earlier AAVE than the community we examine here, some isolated situations in the United States should offer equally revealing insight. There is comparable social and physical insularity though the geographic dislocation may not be as great as that of expatriate transplant communities. Furthermore, in the case examined here, the historical continuity and time depth are actually greater than that found in some transplant situations. This unique situation therefore offers a critical perspective on the development and maintenance of ethnolinguistic distinctiveness in earlier of AAVE.

1. The Unique Status of Hyde County, North Carolina
The bi-racial community of Hyde County, North Carolina, located along the eastern seaboard of North Carolina by the Pamlico Sound, was first inhabited by Europeans in the first decade of the 1700s, making it one of the oldest Anglo American settlement communities in North Carolina. Shortly thereafter, African Americans were brought to the area (Kay & Cary 1995). Although the region once thrived as a major inlet for ships sailing the Atlantic Ocean, the inlet fell into relative disuse in the mid-1800s, leaving the area isolated. In fact, the first official census conducted in 1790 (4,120) and the most recent census figures in 1990 (5,411) show that Hyde County has gained less than 1,500 people over two centuries.

This remote coastal setting, which has maintained an African American population of between a quarter and a third of the overall population of Hyde County for almost three centuries, provides an ideal context for examining several critical issues regarding the historical development of African American speech. It offers a sociolinguistic context involving a long-term, relatively insular bi-racial situation featuring a distinctive Anglo American variety; the Outer Banks dialect described in a number of recent publications (e.g. Wolfram & Schilling-Estes 1995, 1997, Wolfram, Hazen, & Schilling-Estes 1999) is found in this coastal mainland region as well as on the Outer Banks. Figure 1 indicates the location of Hyde County and delineates the approximate isogloss for the traditional Outer Banks dialect. The historical continuity of the African American community in the region further provides an important perspective on the possible genesis and early development of AAVE. It offers additional insight into how African American speech developed with respect to local Anglo American vernacular varieties of English.
Reconstructing the History of AAVE

Figure 1. Hyde County and the Boundaries of the Outer Banks Dialect

Virginia

Raleigh

Hyde

Ocracoke

South Carolina

Our data (Green 1998, Wolfram, Thomas, & Green 2000, Childs 2000) suggest that some earlier dialect features of the English spoken by African Americans were congruent with the distinctive regional varieties of English spoken by their Anglo American cohorts. But there is also evidence for some long-standing, selective structural differences in Anglo American and African American varieties, even in small, bi-racial enclave communities. Finally, there is evidence for the more recent development of a supra-regional variety of AAVE that is being adopted by younger African Americans.

2. A Comparative Profile of Hyde County African American Speech

Since 1997, the staff of the North Carolina Language and Life Project has interviewed over a hundred long-term residents of Hyde County, 65 African Americans and 43 Anglo Americans. The age range of the speakers spans a century in apparent time, from those born as early as the 1890s to those born in the 1990s. Subjects were chosen following the social network procedure of locating a friend of a friend (Milroy 1987) and a family-tree social network method in which different members of extended families were interviewed (Green 1998). Our analysis is based on a subset of data from the conversational interviews conducted with participants, typically 32 African Americans divided into four generational groups (those born between 1898-1920, 1924-1949, 1953-1963, and 1971-1983) and a baseline group of 8 Anglo Americans (For more extensive analysis of the speech of Anglo Americans of the region, see Wolfram, et al. 1999). A representative set of diagnostic variables has now been studied in some detail; these include the vowel system (Thomas forthcoming, Wolfram, Thomas, & Green 2000), phonotactic patterns such as syllable-coda consonant cluster reduction (Childs 2000), copula absence (Green 1998), past tense be leveling (Green 1998), and –s verbal marking (Wolfram, Thomas, & Green 2000). A qualitative overview of the results is given in table 1. The table compares older and younger Hyde County African Americans and Anglo Americans, as well as
contemporary AAVE as described in regions other than Hyde County (e.g. Fasold & Wolfram 1970, Labov 1972, Fasold 1972, Baugh 1983, and Rickford 1999). In table 1, distinctive patterns among the groups are indicated by shading. The co-existence of patterns is indicated by +/- or -/+ , with the dominant variant indicated first.

Table 1. Summary of Vernacular Dialect Alignment

<table>
<thead>
<tr>
<th>DIALECT FEATURE</th>
<th>ELDERLY HYDE ANGLO AMER.</th>
<th>ELDERLY HYDE AFRICAN AMER.</th>
<th>YOUNG HYDE ANGLO AMER.</th>
<th>YOUNG HYDE AFRICAN AMER.</th>
<th>URBAN AAVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHONOLOGY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevocalic CCR in bes’ egg</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Postvocalic -r in year time</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Backed /aɪ/ in time</td>
<td>+</td>
<td>+</td>
<td>+/–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Unglided /aɪ/ in time</td>
<td>-</td>
<td>-</td>
<td>+/–</td>
<td>–</td>
<td>+</td>
</tr>
<tr>
<td>Front-gliding /aʊ/ in town</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Lowered /ɛr/ in bear</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Raised, unglided /ɔ/ in caught</td>
<td>+</td>
<td>+</td>
<td>–/–</td>
<td>–/–</td>
<td>–</td>
</tr>
<tr>
<td>Fronted /o/ in coat</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td><strong>MORPHOSYNTAX</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NP 3rd pl. Subj. Verbal -s</td>
<td>+</td>
<td>+</td>
<td>+/–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pro 3rd pl. Subj. Verbal -s</td>
<td>-</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3rd sg. -s Absence</td>
<td>-</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Habitual be verb -ing</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>Copula Abs.</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Was Regularization</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Weren’t Regularization</td>
<td>+</td>
<td>+</td>
<td>+/–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

As shown in table 1, some earlier dialect features of the English spoken by Hyde County African Americans paralleled the distinctive regional features used by their Anglo American cohorts, but there is also evidence for long-standing, selective structural differences in the Anglo American and African American varieties of Hyde County. For example, the data for the elderly speakers (born between 1898 and 1920), which would be most reflective of the earlier speech of the County given the apparent time construct (Bailey, Wikle, Tillery, & Sand 1991), shows that African Americans and Anglo Americans shared the same distinctive Outer Banks vowel system (Wolfram, Thomas, & Green 2000,
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Thomas forthcoming). At the same time, the process of syllable-coda consonant cluster reduction apparently operated differently for the two groups of speakers in the past. In a similar way, earlier African Americans used the distinctive Outer Banks dialect pattern of past be leveling in which positive constructions level to was (e.g. I/you(s)he/we/y'all/they was there) whereas negative constructions level to weren't (e.g. I/you(s)he/we/y'all/they weren't there). The data indicate further that the adoption of regional structures was not always isomorphic, so that the African American version of verbal -s marking with 3rd pl. subjects is more general than that found among their Anglo American cohorts. The Anglo American version of this concord rule limits it to noun phrase subjects (e.g. The ducks likes food) whereas the African American version generalizes the application to both noun phrase and pronoun subjects (e.g. They ducks likes food and The ducks likes food). And, of course, there are innovative features of supra-regional AAVE that have been adopted by younger African Americans, such as habitual be with verb –ing.

One of the important lessons to be taken from this examination concerns the selection of structures for investigating earlier African American speech. An authentic picture of earlier African American speech can emerge only if a wide array of dialect structures is considered, including overall profiles of vowel systems and profiles of complete tense, aspect, and modal systems. Selective, single-structure studies may reveal significant insight into a particular linguistic process and/or on a particular dimension of an ethnolinguistic boundary, but such studies may obscure or even distort our understanding of the overall relationship of African American speech to other varieties.

Finally, the comparison of older and younger African American speakers in Hyde County with some of the core structures of contemporary AAVE spoken elsewhere indicates change toward a supra-regional norm. Evidence from the ongoing change in Hyde County supports the contention that African American speakers are diverging from their Anglo American vernacular cohorts as local dialect features are being replaced by a more widespread, common-core set of AAVE features.

3. Patterns of Accommodation and Distinctiveness
In this section, we illustrate specific patterns of historical dialect congruence and distinctiveness for African American and Anglo American speakers in Hyde County by examining two phonological features and two morphosyntactic features. These diagnostic structures demonstrate the pattern of earlier dialect congruence and distinctiveness and show how the respective patterns are currently undergoing change.

3.1 /ai/ Backing: A Case of Historical Convergence
One of the dialect icons of the Outer Banks dialect is the backing and raising of the nucleus of the vowel /ai/ in words like time or tide, so that it is produced
phonetically as [ŋ] or [ʌ̃]. This distinctive vowel production has now been amply documented for the Anglo American community by Wolfram & Schilling-Estes (1995), Schilling-Estes & Wolfram (1999), and Wolfram, et al (1999). To examine whether or not African Americans participated in this dialect pattern, we extracted both impressionistic and acoustic data on /ai/ (See Wolfram, Thomas, & Green 2000 for the acoustic analysis) for a subset of speakers representing the four generational groups of African Americans and a baseline subset of elderly Anglo Americans in Hyde County. For each speaker, we impressionistically extracted up to 100 tokens of /ai/ and coded each one in terms of three categories: (1) the backed raised variant [ʌ̃] typical of the regional Outer Banks dialect; (2) the unglided variant [a] typical of contemporary AAVE as well as many Southern mainland varieties of English, and (3) the non-backed, glided variant [æ] typical of most Northern varieties of English. The data were then subjected to multivariate statistical analysis using VARBRUL. VARBRUL is a probabilistic-based multivariate procedure that shows the relative contributions of different factors to the overall variability of fluctuating forms. Factor groups may consist of independent linguistic constraints, such as following phonological environment, or external social variables, such as age group or social affiliation. The weighting values range from 0 to 1; in a binomial application, a value of greater than .5 indicates that the factor in question has a favoring effect on the occurrence of the variant, while a value of less than .5 indicates a disfavoring effect. Two binomial analyses were conducted, one in which the regional, backed-raised variant was treated as the “application variant” and the other variants as the non-application, and one in which the glide-reduced variant was considered the application variant and the other variants as the non-application. The results of the two analyses are given in table 2.

The VARBRUL analysis, as well as the acoustic analysis found in Wolfram, Thomas, & Green (2000), indicates that elderly African Americans in Hyde County clearly accommodated to the traditional backed and raised Outer Banks production of the /ai/ vowel, whereas younger speakers have moved away from that norm and now embrace the widespread AAVE unglided variant. This evidence, along with evidence from the overall vowel system analysis given in Wolfram, Thomas, & Green (2000), clearly demonstrates that African Americans and Anglo Americans in Hyde County once shared a common vowel system.
Table 2. Comparison of /ai/ Backing-Raising and Ungliding: VARBRUL Results

<table>
<thead>
<tr>
<th>Backing/Raising (application)</th>
<th>Ungliding of /ai/ (application)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Probability</td>
<td>.20</td>
</tr>
<tr>
<td>Age:</td>
<td>Input Probability</td>
</tr>
<tr>
<td>Elderly Anglo American</td>
<td>.58</td>
</tr>
<tr>
<td>Elderly African American</td>
<td>.62</td>
</tr>
<tr>
<td>Senior African American</td>
<td>.53</td>
</tr>
<tr>
<td>Middle African American</td>
<td>.60</td>
</tr>
<tr>
<td>Young African American</td>
<td>.19</td>
</tr>
<tr>
<td>Following Phonological Env.</td>
<td>Following Phonological Env.</td>
</tr>
<tr>
<td>Nasal</td>
<td>.53</td>
</tr>
<tr>
<td>Vd Obst.</td>
<td>.57</td>
</tr>
<tr>
<td>VI Obst.</td>
<td>.41</td>
</tr>
<tr>
<td>Chi Square per Cell</td>
<td>1.522</td>
</tr>
<tr>
<td>Chi Square per Cell</td>
<td>.437</td>
</tr>
</tbody>
</table>

3.2. Consonant Cluster Reduction: A Case of Historical Divergence

The deletion of the final stop in syllable-coda clusters (e.g., *tes* ‘test’, *col* ‘cold’, *ac* ‘act’) is a highly diagnostic feature in American English dialects (Wolfram & Schilling-Estes 1998). It is also a process heavily influenced by various independent linguistic constraints, such as phonological environment and the morphemic status of the cluster. Whereas all speakers of English have some cluster reduction in preconsonantal contexts (e.g., *tes* ‘case’), extensive cluster reduction in prevocalic contexts (e.g., *tes’ on*) is often indicative of phonological transfer (Wolfram, Childs, & Torberg 2000) from a language not having syllable-coda clusters. Childs (2000) provides an extensive analysis of cluster reduction for 40 speakers from Hyde County, 32 African Americans evenly distributed in four age categories and a baseline group of 8 Anglo-American speakers. Figure 2 summarizes the incidence of prevocalic consonant cluster reduction for monomorphemic (e.g., *guest, mist*) and bimorphemic (guessed, missed) clusters, along with the figures of the VARBRUL analysis as reported in Childs (2000).

The analysis clearly indicates that prevocalic cluster reduction has been, and continues to be, markedly different for the African American and Anglo American speech communities in Hyde County, despite the apparent congruence of other aspects of their phonological systems. It is particularly noteworthy that this phonotactic pattern has shown persistent ethnolinguistic distinctiveness while many paradigmatic dimensions of phonology, such as their vowel systems, have been shared by both groups of speakers. The data suggest further that extensive prevocalic consonant cluster reduction among African Americans may be indicative of a long-term substratal effect from the original language contact situation involving English and West African languages devoid of syllable-coda clusters (Welmers 1973). Clearly, prevocalic cluster reduction in Hyde County indicates selective and persistent ethnolinguistic distinctiveness.
3.3. Leveling to *Weren’t*: A Case of Morphosyntactic Convergence

Studies of Outer Banks English (Schilling-Estes & Wolfram 1994; Wolfram et al. 1999) have shown a distinctive, remorphologized pattern of past tense *be* regularization in which leveling to *was* takes place in positive constructions (e.g. *The dogs was down there* or *We was down there*) and leveling to *weren’t* takes place in negative constructions (e.g. *I weren’t there; It weren’t nice*). Whereas leveling to *was* is quite common in English vernaculars around the world (Chambers 1995:243), Hyde County English participates in the much more restricted, remorphologized version of *weren’t* leveling among English dialects (Trudgill 1990, Cheshire 1982). The typical pattern of past tense *be* leveling for AAVE regularizes *was* in both positive and negative constructions (Weldon 1994), thus aligning it with the more widespread pattern among English dialects. Figure 3 indicates the incidence of leveling to *was* and leveling to *weren’t* for the four generations of African Americans and the baseline older Anglo Americans in Hyde County. The accompanying VARBRUL analysis considers the effect of subject type on *was* and *weren’t* leveling for the African-American speakers, since previous studies have shown both *was* and *weren’t* leveling to be sensitive to a type of subject constraint (Schilling-Estes & Wolfram 1994, Hazen 1996, Tagliamonte & Smith 1999). For example, leveling to *was* is favored when the subject is a noun phrase vs. a pronoun (e.g. *The dogs was > They was*), and strongly favored with existential subjects (e.g. *There was dogs at home*). Studies of variable constraints on leveling to *weren’t* show more varied patterning, as
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some dialects (Schilling-Estes & Wolfram 1994) show a favoring effect for existentials (e.g. *There weren’t a dog*) and other varieties indicate a favoring effect with first person subjects (e.g. *I weren’t there*).

Figure 4. Past Tense be Leveling

VARBRUL Analysis:

<table>
<thead>
<tr>
<th>Leveled to <em>was</em>:</th>
<th>Leveled to <em>weren’t</em>:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Probability</td>
<td>Input Probability</td>
</tr>
<tr>
<td>3rd NP</td>
<td>3rd NP</td>
</tr>
<tr>
<td>Existential</td>
<td>Existential</td>
</tr>
<tr>
<td>2nd Sing./pl. PN</td>
<td>1st Sing.</td>
</tr>
<tr>
<td>3rd pl. PN</td>
<td>3rd NP</td>
</tr>
<tr>
<td>1st pl.</td>
<td>3rd Pro</td>
</tr>
</tbody>
</table>

The figures for *was* and *weren’t* leveling show that elderly African Americans in Hyde County align with the pattern characteristic of the local Anglo American community, whereas younger African Americans have abandoned this pattern in favor of a more generalized version of leveling to *was* unconstrained by polarity—the more common AAVE pattern. The results for elderly African Americans indicate high levels of leveling to *was* and to *weren’t*, thereby indicating a fairly remorphologized version of the rule on the basis of polarity. Younger African Americans retain *was* leveling but relinquish *weren’t* leveling. The slight decline of leveling to *was* among younger African Americans may be attributed to the effects of more extensive exposure to mainstream standard dialects, whereas the recession of leveling to *weren’t* among younger African
Americans is a significant departure from the traditional, localized vernacular norm.

The VARBRUL analysis indicates constraints that are similar to those found in other studies of *was* and *weren't* leveling. *Was* is favored with NP plural subjects over pronouns (Hazen 1996; Tagliamonte & Smith 1999) and *weren't* is favored for existentials, just as it is on the Outer Banks (Schilling-Estes & Wolfram 1994). The comparison of *weren't* and *was* regularization clearly shows that elderly African American speakers aligned with their local Anglo American cohorts, but that this pattern has been abandoned in favor of the more common AAVE pattern among younger African Americans in Hyde County.

3.4. **Copula Absence: A Case of Persistent Divergence**

The absence of copula and auxiliary for contractible forms of *is* and *are* (e.g. *She nice* 'She’s nice', *They acting silly* ‘They’re acting silly’*) has been one of the most highlighted structures of AAVE (e.g. Labov 1969, Wolfram 1969, Baugh 1983, Winford 1997, 1998, Rickford 1997, 1998). Although restricted copula absence has sometimes been found in white Southern rural varieties, its use in these varieties has been attributed to assimilation from African American speech rather than to donor dialects in the British Isles (Wolfram 1974). In figure 5, the incidence for the overall deletion of *is* and *are* is summarized for the elderly Anglo American baseline group and for the four different generations of African Americans, along with a VARBRUL analysis for independent linguistic effects for African American speakers. Following the tradition of other studies (e.g. Labov 1969, Wolfram 1969, Baugh 1983, Rickford 1998), we consider constraint effects based on copula form (*is* vs. *are*), subject type (NP vs. pronoun) and predicate complement type (predicate nominative as in *She the woman*, predicate adjective as in *She nice*, predicate locative as in *She in the house*, verb – *ing* as in *She running*, and gonna as in *She gonna go*).

It is quite clear that copula absence is a distinctly African American trait in Hyde County. Although some rural white Southern American vernacular varieties share copula absence to a limited degree (Wolfram 1974, Bailey & Maynor 1985), Outer Banks English is not one of them (Wolfram, Hazen, & Tamburro 1997). Thus, we see a significant discontinuity in both earlier and current versions of African American and Anglo American speech in Hyde County with respect to copula absence. At the same time, the variable constraints on copula absence for AAVE in Hyde County indicated in the VARBRUL analysis parallel quite closely those found in other studies (Labov 1969, Rickford 1998): *are* favors absence over *is*, preceding pronouns favor absence over NPs, and the complements *gonna* and verb *-ing* favor absence over predicate nominatives and predicate adjectives. In Hyde County, copula absence has been, and continues to be, a distinguishing trait of AAVE that is not shared by the local Anglo-American variety.
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Figure 5. Incidence of Copula/Auxiliary *are* and *is* Absence

VARBRUL RESULTS:
Input probability = .28

*is/are:*
- *is* = .44; *are* = .69
Subject:
- NP = .43; *pro* = .56
Pred. Comp.:
- nom = .34; adj = .54; loc = .45; V-ing = .65; *gonna* = .76

*Chi square per cell* = 1.285

4. Conclusion

Our consideration of a unique, long-standing bi-racial dialect enclave reveals important insight into the state of earlier AAVE as well as its development in the twentieth century. One important finding is the apparent accommodation of earlier African Americans to some of the local regional dialect norms of their Anglo American cohorts. This accommodation is particularly evident in the paradigmatic parameters of phonology such as the vowel system, but also found in some of the morphosyntactic traits as well. For example, it is obvious that past tense leveling of *be* in earlier Hyde County AAVE accommodated to the local norm, along with some other dimensions of verbal concord (Wolfram, Thomas, & Green 2000).

At the same time, the data indicate that a core set of distinctive vernacular dialect structures developed within earlier AAVE. Given the time-depth of the community and the accommodation of African Americans to many local dialect features, it is most reasonable to attribute these distinctive entholinguistic traits to the long-term effects of the earlier contact situation between Africans and Anglo
Americans. There is no basis for attributing structural traits such as copula absence and prevocalic cluster reduction to the founder English dialects from the British Isles since they apparently did not exist there and do not exist in the cohort Anglo American dialects of Hyde County. Furthermore, it is unlikely that they would be recent innovations since these features co-existed with the traditional local dialect traits for extended periods of time. While the extent of the Outer Banks regional dialect influence on the historic Hyde County African American community is impressive, the persistence of selective features that may have marked ethnicity for several centuries in the remote environs of Hyde County is even more noteworthy. Evidence for a long-term substratal effect against a background of accommodation to local norms is certainly one of the most remarkable aspects of earlier AAVE in this context.

Finally, the current direction of change among Hyde County African Americans should be noted. Although there are still vestiges of the localized dialect evident in the speech of some younger African Americans, particularly with respect to phonology, the recession of the traditional Outer Banks dialect has been rather dramatic. The pattern of dialect recession for the traditional dialect is not unlike the decline found in the speech of Outer Banks Anglo Americans (Wolfram, et al. 1999), but the replacive norms are quite different. African Americans are clearly supplanting the vernacular Outer Banks English with core AAVE features, quite unlike their Anglo Americans cohorts. In an important sense, then, the ethnolinguistic divide between the groups is growing, not only because AAVE continues to develop on an independent course of change (Dayton 1996), but because African Americans have also been losing some of the distinctive regional dimensions that they once shared with their cohort Anglo Americans. Durable enclave situations such as Hyde County have much to teach us about the development of earlier African American speech and its current trajectory of change. The development of AAVE is certainly complex and diverse, but such unique situations help clarify the role of accommodation to local norms and reveal a persistent pattern of selective ethnolinguistic distinctiveness in the past and present development of AAVE.

References

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On the Origin of Coda Voicing in Lezgian

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0. Introduction
In Lezgian, a Nakho-Daghestanian language spoken in southern Daghestan and northern Azerbaijan in the eastern Caucasus, unaspirated voiceless obstruents and ejectives are voiced in coda position in monosyllabic nouns. This 'coda-voicing' pattern is typologically unexpected and phonetically unnatural. In this paper, I will present an account of the historical development of the coda voicing, illustrating that the synchronic coda-voicing pattern is a result of a series of phonetically natural sound changes. Following that, I will briefly discuss some implications of the laryngeal alternation in Lezgian.

1. Data
1.1. Background
All synchronic data presented in this paper, unless specified otherwise, are drawn from Haspelmath 1993. The consonant inventory of Lezgian is given in (1).

(1) Consonant inventory (54 members)

<table>
<thead>
<tr>
<th>b</th>
<th>d</th>
<th>pʰ</th>
<th>tʰ</th>
<th>tʰw</th>
<th>tsʰ</th>
<th>tsʰw</th>
<th>g</th>
<th>gʰ</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>t</td>
<td>tʰ</td>
<td>ts</td>
<td>tsʰ</td>
<td>tʰw</td>
<td>kʰ</td>
<td>kʰw</td>
<td>kʰq</td>
</tr>
<tr>
<td>pʰ</td>
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<td>tʰw</td>
<td>ts</td>
<td>tsʰ</td>
<td>tʰw</td>
<td>kʰ</td>
<td>kʰq</td>
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<td>3</td>
<td>3</td>
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</tr>
<tr>
<td>f</td>
<td>r</td>
<td>s</td>
<td>sʰ</td>
<td>tʃ</td>
<td>tʃʰ</td>
<td>k’</td>
<td>k’w</td>
<td>q</td>
</tr>
<tr>
<td>m</td>
<td>n</td>
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<td>m</td>
<td>m</td>
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</tr>
</tbody>
</table>

* I would like to thank Johanna Nichols for sharing her data and insights with me. I am also grateful to Andrew Garrett, Sharon Inkelas, and Larry Hyman for discussions and comments. Any errors are of course my own. This paper is based upon work supported under a National Science Foundation Graduate Research Fellowship. Any opinions, findings, conclusions, or recommendations expressed herein are those of the author and do not necessarily reflect the views of the National Science Foundation.
1.2. **Word-final unaspirated voicing in monosyllabic nouns**

Haspelmath (1993) reports that voiceless unaspirated stops become voiced in word-final position in certain monosyllabic nouns. Some examples are shown in (2), with the relevant segments printed in boldface. This pattern was also observed by Trubetzkoy in 1931. The voiceless unaspirated stops surface as voiceless unaspirated intervocally and when followed by an /r/ (2e).

(2) Underlying word-final unaspirated voiceless stops in monosyllabic nouns

| a. | tf\(\text{eb}\) | tf\(\text{ep}\)-edi | day | c. | le\(\text{g}\)\(\text{w}\) | lek\(\text{w}\)-e | wash tub |
| b. | pab | pab-a | wife | | tseg\(\text{w}\) | tsek\(\text{w}\)-re | ant |
| | j\(\text{ab}\) | j\(\text{ap}\)-u | ear | | rug | ruk\(\text{w}\)-adi | dust |
| b. | rad | rat-uni | intestine |
| | gad | gat-u | summer |
| | ked | ket-re | star; fish |
| e. | laz | lats-adi | kaolin |
| | mez | mets-i | tongue |
| | warz | warts-ar | month, moon |

However, further investigation reveals that the voicing of voiceless unaspirated stops also occurs in the pre-consonantal position as shown (3). The only exception where voiceless unaspirated stops are not voiced in pre-consonant position is when the suffix is an approximant (4).

(3) Underlying voiceless stops as voiced in coda position.

| xeb | xeb-mal | 'animal-cattle' |
| qab | qab-mab | 'boxes and similar things' |
| j\(\text{uk}\) | j\(\text{ur}\)-di | 'all day' |
| gad | gat-u | 'summer' |

(4) tseg\(\text{w}\) | tsek\(\text{w}\)-re | 'ant-OBL'
| warz | wats-ra | 'moon/month-OBL'

1.3. **Word-final ejectives voicing in monosyllabic nouns**

Haspelmath (1993) also observes that underlying ejectives become voiced word-finally in a number of monosyllabic nouns whose initial consonants are also ejectives (5). Note that a very recent development in Lezgian has syncopated some of the high vowels.

(5) q\(\text{e}\)b | q\(\text{ep}\)-ini | cradle | t\(\text{j}\)\(\text{i}\)b | t\(\text{j}\)\(\text{h}\)p'-er | span |
| t\(\text{ab}\) | t\(\text{ap}\)-uni | block, log | q\(\text{y}\)yd | q\(\text{h}\)yt'-yz | winter |
| t\(\text{ub}\) | t\(\text{h}\)\(\text{w}\)p'-u | finger | ts\(\text{i}\)b | ts\(\text{h}\) p'-er | pot |
| t\(\text{i}\)b | t\(\text{h}\) p'-er | owl | ts'ig | ts\(\text{h}\) k'-er | middle |

\(^1\) The 'r' in CVrC stem is deleted when an r-initial suffix is attached.
One example is found where the underlying ejective become voiced in the coda position. This is shown in (6).

(6) q’y’d q’y’d-di ‘all winter’ vs. q’hyt’-yz ‘in the winter’

1.4. Two problems

The fact that coda unaspirated obstruents and ejectives should become voiced is highly unusual. Typologically, word-final and pre-consonantal positions in general are among the most common place for voicing neutralization. However, the contrast between voiced and voiceless segments usually neutralizes toward voicelessness. This tendency has been corroborated by numerous phonetic studies, showing that voicing is generally more difficult to perceive and produce in coda position (see Steriade 1997 and references therein). In fact, in her seminal work on the phonetics and phonology of laryngeal contrast, Steriade (1997) postulates the scale of voicing perceptibility according to contexts, as shown in (7). She bases this scale on evidence from previous phonetic research and her survey on the typology of the contexts in which voicing neutralization generally occurs. The triangle sign ▷ indicates that voicing in one context is more perceptible than in the context to its right.

(7) Scale of obstruent voicing perceptibility according to context

V_[-son] ▷ V_-[-son] ▷ V_[-[-son], [-[-son], #[-[-son]]

According to this approach, which she dubbed Licensing by Cue, preconsonantal and final positions are among the worst contexts for the perception of voicing. Thus, in many languages, the voicing contrast is suspended in precisely these positions. In most instances, the only laryngeal specification allowed in preconsonantal and final positions is the lack of voicing. Yet, what I find in Lezgian is exactly the opposite of this scenario.

To complicate the problem even more, in final position, there are four types of laryngeal contrast. Some examples of final voiced stops are given in (8), final ejectives in (9), final voiceless aspirated in (10) and final voiceless unaspirated in (11).

(8) Final voiced stops
k’y’d nine
dar mountain
bi3 illegitimate child
tʃ’i3 bee
dad taste

(9) Final ejectives
jak’w axe
kits’ dog
k’uk’ peak
k’wat’ lump, ball

(10) Final voiceless aspirated stops
k’haf’h bitch
lak’h bed (in the garden)
nek’h milk
net’h louse
peq’h crow

(11) Final voiceless unaspirated stops
dust friend
waxt time
myx’ts barn

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Note that the final voiceless unaspirated obstruents in (11) are all preceded by fricatives. Voiceless unaspirated obstruents do not surface alone in final positions in Lezgian.

Given the fact that voiceless unaspirated obstruents and ejectives are generally allowed in final positions, it is puzzling that the coda-voicing pattern only occurs in nouns that are monosyllabic. For the remainder of this paper, I will explain how the coda voicing alternation arose in the historical phonology of Lezgian. I will also attempt to explain why only monosyllabic nouns acquired this peculiar laryngeal alternation.

2. **Historical excursus**

Before we dive into the discussion of the development of coda voicing in Lezgian, one must first understand the affiliation of Lezgian within the Lezgic language family. The internal structure of the Lezgic family, reproduced from Schulze 1994, is given below (12).

(12)

```
  Proto-Lezgian
     /\          /
   Archi Xinalug Udi  Proto-Samur
          /\            /
         Western Central Eastern
            /\     /\    /\    /\ 
           Caxur Rutul Kryz Budux

        Lezgian
            /
          Tabasaran Aghul
```

In this section, I will argue that coda voicing did not originate from one single phonetic sound change. In fact, it will be argued that there was no coda voicing in Lezgian historical phonology at all. The historical origin of the synchronic coda voicing is in fact the result of a series of phonetically motivated sound changes. The ensuing synchronic alternation is a matter of telescoping.

2.1. **Coda unaspirated voicing explained**

(13) provides the correspondences for three words (i.e. water, tongue, and moon) in fifteen Lezgic languages and dialects. The data is a slightly expanded version of a comparative Nakh-Daghestanian cognate database compiled by Prof. Johanna Nichols. The additional data comes from Standard Lezgian, which is based on the lowland Gune dialect. The original database, in turn, consists of sixty-four cognate sets extended from a pre-compiled word lists from Gigineishvili 1977 and Bokarev 1981. Of the sixty-four cognate sets, three of them are relevant to our present discussion and are given in (13). I have also reconstructed the quasi-Pre-Lezgian forms for each of the words. They are only ‘quasi-reconstructed’ because a systematic reconstruction is not possible with the limited data available. The quasi-Proto-Nakh Daghestanian reconstruction by Prof. Nichols for each of these forms is also provided at the bottom of each of the cognate set columns.
On the Origin of Coda Voicing in Lezgian

(13) Three cognate sets from fourteen Lezgian languages and their reconstructed forms

<table>
<thead>
<tr>
<th>Language</th>
<th>a. ‘water’</th>
<th>b. ‘tongue’</th>
<th>c. ‘moon’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lezgian. Gune</td>
<td>jad</td>
<td>mez</td>
<td>warz</td>
</tr>
<tr>
<td>Lezgian. Axtyn</td>
<td>jad⁹-ar</td>
<td>mez</td>
<td>warz</td>
</tr>
<tr>
<td>N. Tabassaran</td>
<td>shaj</td>
<td>mildzi</td>
<td>wadza</td>
</tr>
<tr>
<td>S. Tabassaran</td>
<td>shid</td>
<td>meldzi</td>
<td>waz</td>
</tr>
<tr>
<td>Agul. Burschag</td>
<td>sher</td>
<td>mez</td>
<td>waz</td>
</tr>
<tr>
<td>Agul. Richa</td>
<td>xed</td>
<td>mez</td>
<td>waz</td>
</tr>
<tr>
<td>Agul. Burkixan</td>
<td>xer</td>
<td>mez</td>
<td>waz</td>
</tr>
<tr>
<td>Agul. Fite</td>
<td>xid</td>
<td>mez</td>
<td>waz</td>
</tr>
<tr>
<td>Rutul</td>
<td>xed</td>
<td>miz</td>
<td>waz</td>
</tr>
<tr>
<td>Tsaxur</td>
<td>xjan</td>
<td>miz</td>
<td>waz</td>
</tr>
<tr>
<td>Kryz</td>
<td>xd</td>
<td>mez</td>
<td>vz</td>
</tr>
<tr>
<td>Budux</td>
<td>xd</td>
<td>mez/mz-ri</td>
<td>vz</td>
</tr>
<tr>
<td>Archi</td>
<td>llhan</td>
<td>mac</td>
<td>bac</td>
</tr>
<tr>
<td>Udi</td>
<td>xe</td>
<td>muz</td>
<td>boe</td>
</tr>
<tr>
<td>Xinalug</td>
<td>xu</td>
<td>mic¹</td>
<td>vac¹</td>
</tr>
<tr>
<td><strong>Pre-Lezgian</strong></td>
<td>*xVd</td>
<td>*madz</td>
<td>*badzVr</td>
</tr>
<tr>
<td><strong>P-ND</strong></td>
<td>*llhin</td>
<td>*madz</td>
<td>*badzVr</td>
</tr>
</tbody>
</table>

Recall that there are no voiced affricates in Lezgian. Historical affricates are the voiced fricatives in present day Lezgian. As shown by the cognate sets above, only three main groups of languages, namely, Tabassaran, Agul, and Lezgian, display some form of root-final obstruent alternation. In the case of Lezgian, a root-final voiced obstruent alternates with its voiceless counterpart intervocally. Notice that the intervocalic voiceless obstruent is unaspirated in Standard Lezgian, but aspirated in the Axtyn variant. There is independent reason to believe that the Standard dialect reflects a more conservative variant than the Axtyn dialect. In Tabassaran, root-final voiced stops, but not affricates, become voiceless geminates in the intervocalic position. This alternation is more transparently illustrated in S. Tabassaran (e.g., shid ‘water’ > shtt-u ‘water-PL’). The final voiced stop in the first N. Tabassaran example (i.e., shaj ‘water-SG’) has apparently lenited to some sort of an approximant. A similar alternation can be observed in the Agul languages.

Consider next the segments of each of these cognate sets (the relevant segments are boldfaced here for ease of reference), it is self-evident that the proto-Lezgian form for each of these words must contain a final voiced obstruent. This can be most clearly illustrated by the cognate set for the word ‘tongue’. The reconstructed quasi-Proto-Nakh Daghestanian form for ‘tongue’ is *madz. Crucially, the final obstruent is a voiced dental affricate. A similar reconstruction is posited for the word ‘moon’. The final obstruent, again, is a voiced affricate. The reconstruction for ‘water’ is a bit more complicated. The Proto-Nakh Daghestanian reconstructed form for ‘water’ is *llhin. However, the Pre-Lezgian reconstructed form is likely to be *xVd, which has a final voiced dental stop. Although I cannot provide a complete reconstruction of all forms found to display the coda voicing alternation, given the evidence presented thus far, it is plausible to
hypothesize that all nouns that participate in the coda voicing alternation must originally have a word-final voiced obstruent in Pre-Lezgian. If this is the case, then the present day Lezgian coda voicing alternation must not be the proper characterization of the historical development. I tentatively refer to this historical development a case of \textit{intervocalic devoicing}.

Intervocalic devoicing, like coda voicing, however, remains a phonological process that is typologically unexpected and phonetically unmotivated. It is also true that there is no evidence of intervocalic devoicing in Lezgian. As shown by the examples in (14), there are ample examples of underlying intervocalic voiced obstruents that do not devoice.

(14) q'abul ‘accept’ kʰudun ‘exhaust’ i ranbuba ‘father -in-law’

In light of the typological and phonetic objections and the apparent lack of evidence in Lezgian of intervocalic devoicing, it seems plausible that the answer to the historical origin of the coda-voicing pattern might reside elsewhere. In the following sections, I will explicate a theory on the origin of the ‘intervocalic devoicing’ process in Lezgian.

2.1.1. Pretonic devoicing in Proto-Lezgian
Giginejshvili (1977), in his treatment of the transition from Proto-Samurian to pre-Lezgian, proposes that there was a process of pretonic gemination. That is, historical voiced stops devoiced and merged with the fortis voiceless geminates immediately preceding a stressed vowel (15).

(15) *b > pp *dzʰ > ccʰ
     *d > tt *g > kk
     *dz > cc

Given this information, it is then possible to explain the intervocalic devoicing as a result of two phonological processes. That is, the actual historical scenario begins with a change of voiced obstruent singletons turning into voiceless geminates in certain contexts. The resulting situation of this sound change was preserved in tact in S. Tabassaran and several Agul languages, at least in the monosyllabic nouns. Geminates, however, were subsequently eliminated in Lezgian’s phonemic inventory, resulting in the present day voiced vs. voiceless singleton alternation. However, in order to understand fully these changes, I must first elucidate the stress system of Lezgian, its nominal inflectional morphology and the interface between the two.

2.1.2.1. General stress assignment in Lezgian
The general location of stress placement is on the second syllable in non-monosyllabic forms. According to Haspelmath (1993), the tendency for stress on the second syllable is so strong that even Russian loanwords are sometimes stressed on the second syllable. For example, Russian \textit{karan’daš} ‘pencil’ is pronounced as \textit{ka’randaš} in Lezgian.

Suffixes are either stress-attracting or stress-neutral in Lezgian. The stress-attracting suffixes can usually attach either only to monosyllabic roots (which result in an ordinary second-syllable stressed word) or to roots of any length. Most of the stress-attracting
suffixes that only attach to monosyllabic roots are plural and ergative suffixes. The significance of this will become apparent in the next sections. As for the stress-neutral suffixes, they are almost all inflectional suffixes (e.g. local cases, tense and mood suffixes, etc.). Given the fact that the placement of stress can be partially determined by the property of individual suffixes and that the location of stress is crucial to our understanding of the pretonic gemination phenomenon, it is, therefore, of paramount importance that the types of suffixes nominal roots generally admit and their respective stress properties are understood.

2.1.2.2. Nominal Inflectional Morphology in Lezgian

Nouns in Lezgian can appear alone with no overt suffixes when they are in the absolutive case. The plural morpheme is suffixed directly to the nominal stem. With the exception of the ergative case marking, all other case markings must apply onto the oblique stem. The oblique stem comprises of the bare nominal stem plus the ergative case suffix. Thus, in order to understand the interaction between the final obstruent of nouns in Lezgian with the nominal suffixes, one only need to consider two inflectional categories: plurality and oblique stem formations.

2.1.2.2.1. Plurality

In Lezgian, the default plural suffix is the stress-neutral -ar. However, this suffix applies mostly to polysyllabic nouns (16).

\[
\begin{align*}
\text{muh man} & \quad \text{muh man-ar} & \text{guest} \\
\text{bal k’an} & \quad \text{bal k’an-ar} & \text{horses} \\
\text{pen zer} & \quad \text{pen zer-ar} & \text{windows}
\end{align*}
\]

Most monosyllabic nouns that end in a consonant form their plural by suffixing the stress-attracting -‘Ar, which surfaces variably as -‘ar or -‘er as determined by palatal vowel harmony (17).

\[
\begin{align*}
\text{tar} & \quad \text{tar-ar} & \text{‘tree’} \\
\text{tum} & \quad \text{tum-ar} & \text{‘tails’}
\end{align*}
\]

\[
\begin{align*}
\text{rib} & \quad \text{rip-er} & \text{‘awl’} \\
\text{pel} & \quad \text{pel-er} & \text{‘hands’}
\end{align*}
\]

This pattern also applies to many, but not all, monosyllabic loanwords, e.g. park-‘ar ‘parks’, fil-‘er ‘elephants’.

2.1.2.2. Case marking

As mentioned earlier, the absolutive case is normally morphologically unmarked. The ergative case is marked by one of the five different types of ergative suffixes. All other cases (e.g. genitive, dative...etc.), however, are formed by the addition of suffixes onto the stem-plus-ergative complex, commonly referred to as the oblique stem or the stem augment. The oblique stem is formed with one of the following ten affixes (18).
(18) a. -di  -a  -i  -u  b. -Adi  -rA  -Uni  -A  -U  
   -ci/-c’i/-ci/-c’i/-zI

The default oblique stem suffix is -di. Almost all polysyllabic nouns, monosyllabic words ending in a vowel, and monosyllabic loanwords form their oblique stem in -di or one of the other remaining suffixes in (18a). The six oblique stem suffixes in (18b) are only used with monosyllabic nouns and they are all stress-attracting. Since the exact morphosyntactic distribution of each of these oblique suffixes is not directly relevant to our present discussion, I shall refer the reader to the discussion provided in Schulze 1984.

3.1.3. Stress-induced gemination and monosyllabic nouns
Recall that the general location of stress placement in present day Lezgian is on the second syllable in non-monosyllabic roots. I will assume here, without argument, that stress was also on the second syllable in Pre-Lezgian. Thus, since native Lezgian non-verbal roots are mostly monosyllabic, when a monosyllabic non-verbal root undergoes some form of suffixation, the stress will automatically land on the suffix immediately following the root. In this precise circumstance, the final obstruent of the root would be in the environment to undergo the pretonic gemination process. This scenario is schematized in (19a). Even though I do not know when exactly this pretonic gemination process was active, it is still possible to understand why final obstruents in polysyllabic forms do not undergo this gemination process. That is, even if the gemination process post-dated the introduction of Arabic and Turkic loanwords, which are the main sources of polysyllabic roots in today’s Lezgian, the final obstruents of polysyllabic roots would never be subjected to pretonic gemination since these final obstruents would not be immediately followed by a stressed nucleus. This is illustrated schematically in (19b).

(19) A hypothetical situation in Pre-Lezgian
   a. Monosyllabic root
      root suffix root-suffix
      CVD + V > CVTT-V
   b. Polysyllabic root
      root suffix root-suffix
      CV CVD + V > CV CCVD-V

In order to complete the story, I need to posit that Lezgian subsequently eliminated all geminates. This then resulted in the present day situation where final voiced obstruents alternate with their voiceless unaspirated counterparts in the intervocalic position. This explanation not only captures the intriguing relationship between the morphological system of Lezgian and the pretonic gemination process, it also provides a principled account as to why only monosyllabic roots participate in the coda-voicing alternation. In addition, our account might shed some light onto the historical origin of the stress-attracting suffixes in Lezgian. That is, these stress-attracting suffixes were not attracting stress at all. They are stressed because the default stress location is on the second syllable of non-monosyllabic forms. Since most of the stress-attracting suffixes only attach to monosyllabic forms, it requires no additional mechanism to explain why these suffixes
bear inherent stress. The story on the origin of all the stress-attracting suffixes, however, is actually more complicated than can be explicated here without bringing our present discussion too far afield. Thus, I shall postpone that discussion to future occasions.

2.2. Coda ejective voicing

So far I have only concerned with the coda unaspirated voicing pattern. I have yet to account for the other coda voicing alternation, that is, coda ejective voicing. I argue that these coda ejectives were also historically voiced. Thus, they underwent the same 'intervocalic devoicing' process. Yet, how could one account for the final ejectives? To answer that, we must reexamine the data. The tokens that participate in coda ejective voicing are given here again in (20).

(20) q'eb q'eβ̣-ini cradle tʃ'ib tʃʰp̪'-er span
t'ab t'ap̪'-uni block, log q'yd qʰyṭ'-yz winter
t'ub tʰẉp̪'-u finger ts'ib tsʰ p̪'-er pot
t'ib tʰ p̪'-er owl ts'ig tsʰ k̪'-er middle

Note that all of these stems contain an initial ejective. It is plausible then to hypothesize that the intervocalic voiceless unaspirated stop assimilated to the preceding ejective. This ejection spreading process was apparently only applicable to voiceless unaspirated obstruents. Word-final voiced obstruents do not turn into ejective obstruents. This is likely due to the fact that voiceless unaspirated obstruents are acoustically more similar to ejectives than to voiced obstruents. If sound change is the result of misperception, as argued by Ohala and many others (cf., Ohala 1983), it is not surprising that voiceless unaspirated stops would be misinterpreted as ejectives in the appropriate environment.

2.3. Nouns with non-alternating final voiced obstruents

In the previous sections, I have illustrated a historical explanation for the synchronic coda-voicing alternation. However, recall that in section 1.1 I have seen nouns with final voiced consonants that do not show a voiceless counterpart in the intervocalic environment. A complete explanation of the coda voicing must also be able to explain away these apparent counter-examples. These non-alternating forms are considered problematic because the historical account presented above predicts that all monosyllabic nouns with final voiced consonant would have a voiceless allophone in intervocalic position.

Upon a close examination, I discovered that these non-alternating nouns fall into one of the following three categories: borrowings from Turkic or Arabic sources (21a), numerals (21b) and borrowings from unknown sources (21c).
Lezgian, as mentioned above, is spoken in southern Daghestan and in north Azerbaijan. It is not surprising to see massive borrowings from the neighboring Turkic language, Azeri. The Arabic borrowings could potentially come from two sources: Azeri and Ottoman Turkish, which have a lot of Arabic loanwords, or Arabic itself since Daghestan was conquered by the Arabs in the 7th and the 8th centuries. It is the result of the massive lexical borrowing from the Turkic and Arabic sources that the once productive ‘ intervocalic devoicing’ alternation became a subregularity in the language as a whole. As for the numerals in (21b), it should be noted that the final –d was historically a gender marker. The final –d only surfaces when the numeral is used alone, which means that the final –d would never occur in the pretonic position, thus pretonic gemination is not expected.

The last source of non-alternating final voiced obstruents is yet to be determined. It is conceivable that the words in (21c) are borrowings from neighboring related Lezgian languages, since they are in very close contact with each other. This last category is admittedly ad hoc, but given the compelling evidence that the intervocalic devoicing process was once prevalent in the pre-Lezgian lexicon, it is more plausible to relegate these exceptions to other sources than to reevaluate the ‘intervocalic devoicing’ process completely.

4.1. Implications
As I mentioned in the introduction, there are two main theories on modeling LN. Under the rubric of Licensing by Cue (henceforth, LBC), Steriade (1997) argues that constraints on the distribution of laryngeal features should make direct reference to perceptual and articulatory factors. In the case of voicing neutralization, she postulates a scale of voicing perceptibility according to context based on evidence from previous phonetic research and her survey on the typology of the contexts in which voicing neutralization generally occurs. The perceptibility scale is reproduced in (22). The sign ▷ indicates that voicing in one context is more perceptible than in the context to its right.

(22) Scale of obstruent voicing perceptibility according to context

\[ V_{[-son]} \rightarrow V_{-} \rightarrow V_{[+son]} \rightarrow \{[-son][+son], [+son][+son], [-son][+son], [+son][+son]\} \]
Steriade further postulates that constraints in phonology should be the direct projection of the perceptibility scale. Thus, in the case of the distribution of voicing, the constraint ranking in (23) is posited.

(23)  Constraints on the distribution of voicing:
      *αvoice / [-son]_-[-son], [-son]_#, #[-son]
      *αvoice / V_-[-son]
      *αvoice / V_-#
      *αvoice/ V_-[+son]

Each of the constraints in (24) corresponds to each of the contexts occupying a distinct position on the perceptibility scale. According to Steriade, ‘[t]he constraints are universally ranked in the order of inverse perceptibility: the lower the context is on the perceptibility scale, the higher ranked the corresponding *[αvoice]/X_Y contraint’.

In this model, a phenomenon such as voicing neutralization is modeled as the interaction between faithfulness to input voicing values and the fixed hierarchy of *voice constraints aligned to the voice perceptibility scale. Steriade implements the faithfulness to input values using the constraint Preserve[feature], which demands the value of the feature in the input must be the same in the output. Thus, in the case of coda devoicing, for example, it is accounted by the constraint ranking in (24).


Despite the fact that this theoretical approach has the benefit of being phonetically grounded, unfortunately, it is not amenable to account for the Lezgian data. That is, according to the LBC approach, preconsonantal and final positions are among the worst contexts for the perception of voicing. Thus, in many languages, the voicing contrast is suspended in precisely these positions. In most instances, the only laryngeal specification allowed in preconsonantal and final positions is the lack of voicing. Yet, what I find in Lezgian is exactly the opposite of the scenario licensed by the LBC approach. Given the perceptual alignment and the strict and universal ranking of phonological constraints advocated by the LBC, it is impossible for the very same system that predicts coda devoicing to also admit the existence of coda voicing. The only remedy would be for the LBC framework to also permit phonological constraints that are phonetically unmotivated or even counter-phonetic. That is, there are no longer only two ‘species’ of the phonological constraints (i.e., constraints that are projections of perceptibility scales and faithfulness constraints such as Preserve [voice]) that make up the constraint inventory, as dictated by LBC. Phonetically unnatural constraints such as the D]o constraint proposed here and the *ND constraint argued in Hyman 1999 must also be allowed in the system. Given the necessity of phonetically-unmotivated constraints in phonological systems, many researchers are questioning whether mechanisms much as LBC are needed in a theory of synchronic phonology (cf. Hale and Reiss 1998, Hyman 1999, Dolbey and Hansson (To appear), Blevins and Garrett 1998).
5. Conclusion

In sum, in this paper, I have introduced a peculiar phenomenon of coda-voicing in Lezgian. In the course of the discussion, I have demonstrated in detail first the historical development of the coda-voicing pattern in Lezgian. I argue that the synchronic coda-voicing pattern is the result of two separate sound changes: pretonic gemination and degemination. I have also provided a formal account of this pattern. I argue that the Lezgian pattern is best treated in terms of morpheme-specific co-phonologies, rather than prespecification. In the end, I also discuss some of the implications the Lezgian pattern has on phonological theories in general.

References


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PARASESSION:
ASPECT
Event Structure vs. Stage Structure and Abstract Aspectual Relations

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1. Introduction
The currently dominant neo-davidsonian view on aspect calculus has driven many to define event structure (in the sense of Pustejovsky 1995) using part-of relations. It will be argued here that this approach is not appropriate for linguistic reasons, and not just for philosophical ones. We will propose an alternative analysis based on abstract aspectual relations, offering a non-mereological treatment of the relations between events, subevents and aspectual viewpoints.

2. Preliminary definitions: some basic aspectual concepts
2.1. Defining event structure and ‘lexical’ aspect
We will distinguish three basic event types: terminations (telic, dynamic), processes (atelic, dynamic) and states (atelic, non-dynamic). Dynamicity indicates that an event has some causal content. We will moreover define atomicity as a property of terminations that cannot be interrupted then resumed; atomic terminations are devoid of proper subparts. Therefore, non-atomic termination sentences allow for the perfect progressive (which we take to describe ‘intermediary’ result states), and are compatible with completely, finish, cf. (1a), whereas atomic termination sentences reject all those markers, cf. (1a):

(1) a. John finished drawing / has been drawing the circle. (non-atomic)
b. *John finished leaving / #has been leaving. (OK only if iterative)

*Many thanks to Nicholas Asher for helpful discussions; the present paper owes much to him.
1 See Asher (1993) & Verkuyl (1993) for such philosophical arguments.
2 Note that although punctual telic events are always atomic, atomic telic events may not be punctual (*the ship has been sinking, cf. Caudal 1999). Punctuality thus seems to be a complex category combining atomicity and non-durativity.
2.2. Event stages

Another central concept we must define is that of *stage structure*, which reflects how events are conceptualized in natural language metaphysics, and more specifically how they are decomposed into distinct *stages* (subevents). We will not be concerned in this paper with ‘real world’ metaphysics, but with a study of event descriptions inasmuch they pertain to natural language metaphysics. We will take stage structure to be more specific that the broad concept of *event structure*, which can apply to any structural property of events. It can be shown that stages admit linguistic realizations, since *predicative structures* (PSs) (i.e., verbs plus their arguments and important modifiers) exhibit different grammatical properties (e.g., the distribution and interpretation of tense morphemes and aspectual modifiers) depending on their stage structure. Specifically, we argue that it is always possible to find some combination of tense and/or adverbial modifiers causing a PS to refer to a stage in isolation, i.e., *independently from other stages*. We will distinguish three types of stages (an example of stage structure is worked out in Figure 1, but see Caudal 2000 for details):

i) *inner stages* are ascribed to all event types; they are their ‘core’ stages, i.e. what Smith (1991) calls *developments*; they are selected by unmarked uses of the *past progressive*, and if non atomic, by *begin* and *start*;

ii) *preparatory stages* are causal event stages instantiated for some types of atomic telic events; they are selected under *prospective readings* of the past progressive (cf. *John was winning the race*); moreover, they are *peripheral* to the stage structure (or ‘detachable’ from it, as argued in Smith 1991), having a presuppositional status (they remain valid under negation and modals; thus *John did not won the race* nevertheless entails *John took part in the race*);

iii) *result stages* are (stative) result subevents; they are ascribed to all event types, although with major differences between telic and atelic ones (cf. Caudal 1999); they can be expressed in English by sentences in the *perfect*.

Figure 1: Stage structure for tenseless PS *Mona – reach the summit*:

Terminus

<table>
<thead>
<tr>
<th>Preparatory stage (PStage)</th>
<th>Inner stage (IStage)</th>
<th>Result stage (RStage)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mona was reaching</em>...</td>
<td><em>Mona reached</em>...</td>
<td><em>Mona has reached</em>...</td>
</tr>
</tbody>
</table>

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3 This notion is similar to Moens & Steedman’s *event nuclei* or C. Smith’s *temporal schemata.*

4 Note that we do not take event terminuses, i.e., endpoints of inner stages, to be stages of their own right, for it is impossible to find any combination of tense and aspectual modifiers focusing exclusively on them.

5 Indeed, not every type of atomic event has PStages; cf. the durative event described by *John was throwing a ball*, which is clearly atomic (*John has been throwing the ball*).
2.3. Aspectual viewpoint: grammatical aspect

We are adopting in this paper a two-component approach to aspectual semantics related to that defended in Smith (1991), distinguishing between 'lexical' and 'grammatical' aspect (e.g., tense morphemes in French and English). Broadly speaking, two types of treatments of grammatical aspect have been proposed in the literature: coercion-based (e.g., Moens & Steedman 1988, de Swart 1998), and viewpoint-based approaches (e.g., Declerck 1979, Smith 1991). Let us compare them briefly, in order to decide which of the two should be favoured.

Coercion-based analyses argue that tense morphemes can be viewed as aspectual coercion operators. For instance, Vlach (1981) treats the past progressive as a type-shifting, 'stativizing' operator. Moens and Steedman (1988) generalized this hypothesis, and argued that English tenses contribute aspectual coercion operators, capable of imposing different sets of constraints both on their input and output events, thereby causing two coercions. Although we cannot demonstrate here in details why this position is empirically debatable, it is worthwhile noting a few things. First, it is questionable whether tenses should be regarded as 'pure' aspectual coercion operators, since the set of all output categories differs from the set of all input categories. Even in Moens & Steedman’s network, most 'terminal categories' are not 'initial' ones (i.e., lexical aspectual categories). In other words, tenses also add aspectual information of a non-lexical kind. Consider the sentence Mona is arriving. Its aspectual meaning is unlike any lexical aspectual meaning, in that it focuses on the PStage while treating the IStage as its possible outcome. Moreover, it has a modal flavour that must also be accounted for.

The viewpoint-based approach to grammatical aspect (cf., e.g. Smith 1991) contrasts with the coercion-based one in that it leaves room for non-lexical aspectual information, for it treats grammatical aspect as a device focusing on some subpart of an event, i.e. adopting some particular 'perspective' on it, this perspective being non-lexical in nature. We will defend here a compromise analysis so as to combine insights from both approaches, and will attribute to tense morphemes an aspectual contribution consisting in aspectual viewpoint operators, sometimes capable of coercing their input categories. Furthermore, we will argue that viewpoints act as temporal anchoring devices. Thus, event boundaries (e.g., culminations, or endpoints contributed by for adverbials) will turn into temporal interval boundaries when mapped by viewpoints onto the time

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6 Mind the inverted commas: we do not claim that event structure info is expressed just by verbs, but by PSs.
7 Note that there is another problem with Moens & Steedman’s approach: they define coercions with respect to only one stage, so that there seems to be an implicit ‘focus’ operation going on.
8 We will not follow Smith (1991) when she excludes coercion by viewpoints. Consider inchoative readings of the French passé simple: Quand il la vut, Yannig aima Mona. ('The instant he saw her, Yannig started loving Mona'). Arguably, the CoS described here is a coerced reading (and does not originate in some lexical ambiguity of states in French, as Smith claims; this would cause countless lexical ambiguities). This fact suggests that viewpoints sometimes coerce events.
domain (cf. Declerck 1979, Depraetere 1995). We will propose the following elementary typology of viewpoints:

i) **Perfective** viewpoints require their input events to imply a change of state (CoS, henceforth), in conjunction with some form of salient boundary (either initial or final); unless adverbial modifiers are used, the focus remains on the IStages of the input events (see section 4.1);

ii) **Imperfective** viewpoints can take most or all types of events as their input, and (in their unmarked uses) focus on PStages or IStages, but CoSSs and associated boundaries (if any) are disregarded;

iii) **Resultative** viewpoints focus on RStages (cf. Caudal 1999); input events may be bounded or not, depending on specific resultative viewpoints (cf. the English *simple vs. progressive perfect*).  

2.4. **Why PStages are peripheral whereas IStages are central**

We will try and show here that IStages should be regarded as *central* to an event’s structure, and PStages as *peripheral* to it (we will not discuss RStages, for they are clearly external in many respects). We have already mentioned the presuppositional status of PStages. Being presupposed, they should be considered as referentially ‘peripheral’ to an event. Moreover, PStages can never appear under the scope of aspectual verbs such as *begin* or *start* – which systematically select IStages. We take this as evidence that PStages are not part of the ‘core’ of an event, while IStages are. Finally, the existence of aspectually neutral (Smith 1991) or underspecified (de Swart 1998) viewpoints naturally focusing on IStages suggests that the latter are unmarked, ‘central’ stages. Thus, sentences describing telic events in the French *futur* can have two readings: bounded, perfective-like readings (2a), or unbounded, imperfective-like ones (2b). Yet the *futur* cannot focus on PStages in either case; it contributes a neutral, underspecified viewpoint.

(2)  
\[ \text{a. Lorsque tu arriveras (e₁), Jean laverá la voiture (e₂)} \]
‘When you arrive, Jean will wash the car’. e₁≤e₂; e₂ telic+bounded trace

\[ \text{b. Lorsque tu arriveras (e₁), Jean dormira (e₂)} \]
‘When you arrive, Jean will be sleeping’. e₁≤e₂; e₂ atelic+unbounded trace

In (2a) and (2b), the *futur* focuses on IStages, treating them as “default”/unmarked stages. The same analysis applies to the English *simple past*, which normally

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9 This typology is not exhaustive, and excludes complex viewpoints, such as the one associated with the English *perfect progressive*, which is in fact an *imperfective resultative* viewpoint.

10 Cf. also Smith (1991), who introduces the related notion of *detachability*.

11 In fact, accessibility of stages to tenses in general also depends on other factors affecting event structure, like adverbial modification; we will come back to this issue in section 4.
focuses on IStages, and on RStages only in marked contexts. Let us move now to the study of the relations connecting stages.

3. How stages and events should be related

3.1. Existing approaches

To this day, two main types of treatments of stage structure have been proposed in the literature: some authors make use of non-linguistic relations between stages (i.e., world knowledge), others of mereology. See Steedman (1996) for a review of the first type of approaches. They present several well-known drawbacks: they are manageable only for small, closed-world models, while falling prey to arbitrariness. We will therefore leave them aside. Let us consider now the second existing type of approach to stage decomposition, namely mereological approaches. Indeed, mereology looks prima facie like an obvious way of relating stages if one considers it sensible to reify events. Davidson (1967) thus states that events are subject to mereological principles, and Pustejovsky (1995) offers an explicit mereological approach: stages are related via the RESTR feature in the EVENSTR feature structure of Generative Lexicon (GL) entries, and RESTR comprises mostly mereological operators (e.g., \(\prec\): exhaustive ordered part-of).

3.2. Why stages should not be mereologically related

Unfortunately, a mereological treatment cannot properly take into account the central vs. peripheral nature of stages. It tends to put all stages on an equal footing, since only one type of relation can be used (namely part-of) to connect them. It might seem that Pustejovsky (1995) solved this problem by introducing the notion of (event) headedness. Headed subevents are aspectually more salient, and headedness licences adverbial modification, e.g., by durative adverbials (for-phrases) for result states. Headed subevents would thus be ‘central’ stages, whereas non-headed subevents would be ‘peripheral’ stages. But we will now show that headedness is in fact orthogonal with ‘centrality/peripheralness’. Take for instance the stage structure we can ascribe to reach the summit and arrive. If we follow Pustejovsky’s definition of headedness, those VPs describe left-headed events, i.e. events with headed causal subevents, allowing for adverbal modification (cf. John quietly reached the summit/arrived). Contrariwise, modification of their result states by a for-phrase is ruled out (??John reached the summit/arrived for an hour), they are therefore not headed/salient. Yet reach and arrive-events obviously have peripheral causal subevents (they have a presuppositional status, and allow for prospective readings in the progressive).

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12 See Lascarides & Asher 1993; according to them, the simple past licences reverse causal order iff. the ‘default’ Narration Axiom is overridden by some more specific causal information. And crucially, in such cases, the simple past obviously contributes a resultative viewpoint.

13 Similarly, Parsons (1990) adopts a neo-davidsonian position and implicitly relies on a mereological approach, referring to stages as portions of events.

14 Actually, we found out that a similar point was made in Kamp & Reyle (1993:559, note 27).
these are PStages. Thus, there is an obvious mismatch between headedness and centrality: PStages get headed/salient, whereas we would expect them not to be headed. We believe that Pustejovsky (1995:73) confused headedness with ‘centrality’ when he classified *arrive* as describing right-headed events, and simply did not notice that this verb fails the tests he defined for right-headedness. We can thus conclude that ‘headness’ and ‘centrality/peripheralness’ are two distinct categories (see Caudal 2000); peripheralness/centrality is captured merely by the distinction between IStages and other stages (PStages in particular), regardless of their respective salience. While a mereological approach to stage structure is compatible with headedness (or stage salience), we believe it cannot express peripheralness, because peripheral stages are not properly part of an event – this is why verbs such as *begin* cannot take scope over PStages, but only over IStages. In our view, this fact makes it necessary to find an alternative treatment.

4. Stage structure and aspectual viewpoint
We will now turn to the formulation of such an alternative approach. A natural way out of the theoretical puzzle we’ve been discussing consists in treating stages as separate event descriptions, connected *via* non-mereological relations.

4.1. Viewpoints, adverbial modifiers and stage salience
We will argue here that aspect construal involves setting up a hierarchy of salience among stages, starting from lexical information (i.e., a ‘default’ hierarchy of salience). We have already shown that stage ‘centrality/peripheralness’ and stage ‘salience’ are not identical notions. IStages are always central, and PStages are always peripheral (and only them can be peripheral), being presuppositional, etc., even though the latter may not be the least salient stages (cf. e.g., *reach*). We have also implicitly suggested (following Pustejovsky 1995) that some initial salience information is *lexically encoded* (cf. *reach* vs. *arrive* in 3.2). We will therefore attribute *salience hierarchies* to verbal lexical items. We will argue that salience primarily expresses how easily stages can be selected and ‘brought into focus’ by either tenses or adverbial modifiers. A stage with salience 2 will be in focus unless changes about focus/salience information are caused by tenses or adverbial modifiers. Consequently, stages whose lexical salience is equal to 2 (typically IStages) are focused ‘by default’, and do not require any informative device (i.e. non-neutral tense, adverbial modifier) to be brought into focus. Stages with salience 1 can be brought into focus by either adverbial modifiers or non-neutral viewpoints, but are not focused ‘by default’. Finally, stages with salience 3 can be brought into focus only by non-neutral viewpoints (adverbial modification is not licenced for them). If we attribute a ‘IStage (2) > PStage (1) >

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15 This does not amount to claiming that mereology does not play any role in the study of *event structure* at all – we are merely claiming that *stage structure* cannot be based on it. Mereology is useful for other *event structure* issues, such as the internal structure of IStages, in particular in order to distinguish between atomic and non-atomic ones. See Caudal (2000) for details.
RStage (0)' salience hierarchy to reach and arrive-events, we can explain why their RStages cannot be modified using durative adverbials (or other adverbials), while their PStages can. Contrariwise, leave receives a 'IStage(2) > RStage (1) > Pstage (0)' salience hierarchy, thus allowing for adverbial modification of its RStage, but not of its PStage.\(^\text{16}\)

Note also that viewpoint can bring into focus stages with lexical salience 0, thus making them accessible to adverbial modifiers if those have scope over tenses. This is for instance the case with the French durative adverbial depuis ('since'), which cannot focus on the RStages of events described by arriver ('arrive') in the present tense, but can in the passé composé (cf. ??Yannig arrive depuis une heure, vs. Yannig est arrivé depuis une heure, ‘Yannig arrived an hour ago’). Arrive has a RStage with salience 0, but this stage can be brought into focus by the passé composé (thus receiving ‘maximal’ salience) – in which case it becomes accessible to depuis, depuis taking scope over tenses. We will call a stage in focus at the end of the aspect construal procedure asserted; they are the stage a sentence in context refers to, and temporally anchors. We will argue that non-asserted stages are merely implied. Consider the sentence Yannig partit (‘Yannig left’). A perfective viewpoint is used, involving some form of CoS. An IStage is asserted/brought into focus, whereas a RStage and a PStage are just implied. Note that if we take a sentence with an imperfective viewpoint (e.g., Yannig partait, ‘Yannig was leaving’), an IStage is also asserted, but it is merely the possibility of a RStage that gets implied (so as to account for the well-known imperfective paradox). Finally, in the case of a resultative viewpoint, RStages would be asserted and IStages+PStages implied. Furthermore, we believe the implied/asserted distinction to be discursively important, causing stages to have different discursive contributions. The fact that ‘event anaphora’ is possible for asserted stages but not for implied ones (cf. (3)) supports this view.

\[(3) \quad \text{Fred has broken the carafe (IStage)}\_i. \quad ??It_i \text{ took him five seconds.}\]

Our theory of stage structure will make it possible to account for both those issues and focus/salience issues. Crucially, it clarifies what should be done about ‘non-asserted’ stages, whereas it seems to remain a mystery for existing theories.

4.2. Stage structures, stages and abstract relations between stages

We will now outline a formal treatment of stage structures within the DRT framework\(^\text{17}\) (Kamp & Reyle 1993). The aspectual domain can be articulated around three types of entities: event discourse referents (EDRs), stages

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\(^{16}\) See Caudal (2000) for a detailed discussion of this point and related issues, in particular for a classification of events along their salience hierarchies.

\(^{17}\) Although we are using relations not unlike SDRT discourse relations, our treatment pertains to the DRT framework inasmuch our aspectual decomposition is more fine-grained (i.e., clause centered) than the discourse/pragmatics phenomena with which SDRT is usually concerned.
(predications of EDRs, or event descriptions) and stage relations. EDRs (noted \(e_1, \ldots, e_n\)) merely convey spatio-temporal information, and allow for ‘event coreference’ (cf. Danlos 1999). Indeed different stages may share the same EDR (or rather, possess EDRs that will be eventually treated as coreferent):

(4) \textit{John is gone (e\_1). He took French leave (e\_2).}

In (4), the two sentences contribute two different descriptions, but eventually \(e_1 = e_2\). Ontologically, we will assume that stages are predications of distinct EDRs (and not of subparts of one EDR). Therefore, they are proposition-like abstract discourse objects, possessing a truth value (e.g., \(\text{IStage\_leave}(e, \text{mona})\) means it is true that a ‘Mona-leaving’ happened). Formally a stage is represented as a sub-DRS embedded in the main DRS construing the whole sentence. For a given verb, each available stage is lexically encoded, as shown in Figure 2 for reach. Salience is given using subscripts on the right hand side of DRSs representing stages.

\begin{figure}[h]
\centering
\begin{tikzpicture}[level distance=1.5cm, sibling distance=1.5cm]

\node {reach}
child {node {\(K_1 : \lambda e_x \lambda y \lambda x \text{PStage\_reach}(e_x, x, y)\)}}
child {node {\(K_2 : \lambda e_x \lambda y \lambda x \text{IStage\_reach}(e_x, x, y)\)}}
child {node {\(K_3 : \lambda e_x \lambda y \lambda x \text{RStage\_reach}(e_x, x, y)\)}}
child {node {Target (\(K_1, K_2\)) : Target (\(K_2, K_3\))}}
\end{tikzpicture}
\caption{lexical stage structure for reach}
\end{figure}

Note that EDRs within stages are lexically typed – IStage include states (\(\{e\}\)) or processes (\(\{p\}\)) depending on verbs, PStages processes, and RStages states.\(^\text{18}\) Stage structure proper is construed using temporal consecution (Consec) or teleonomy\(^\text{19}\) (Target) to relate stages (i.e., sub-DRSs), depending on stages and verbs (note that formally \(\text{Target}(K_{\alpha_0}, K_{\beta_0}) \leftrightarrow \text{Consec}(K_{\alpha_0}, K_{\beta_0}) \land \text{Dynamic}(K_{\alpha_0})\), with the predicate Dynamic being a defining property of dynamic event referents). We will not say more about those issues for want of space. Of course, Consec gives rise to temporal entailments of the following form: \(\text{Consec}(\langle U_1, \{\ldots P(e_1) \ldots \} \rangle, \langle U_2, \{\ldots Q(e_2) \ldots \} \rangle) \rightarrow e_1 < e_2\). From a formal standpoint, we are thus augmenting the DRT.

\(^\text{18}\) This explains e.g., why sentences in the perfect describe stative events. Some of the type shifts assumed by Moens & Steedman (1988) can thus be expressed using viewpoints.

\(^\text{19}\) Target(\(\alpha, \beta\)) expresses that stage \(\beta\) is targeted by the causal/dynamic stage \(\alpha\). Thus, teleonomy captures what can be intuitively described as ‘dynamically pursued changes of stage’.
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model by adding binary predicates of the form Consec($K_i$, $K_j$) to the set of conditions of a DRS. To sum it up, the aspectual content of lexical entries is a pair $(S, R)$\textsuperscript{20} consisting in a set of stages $S$ and a set of abstract aspectual relations $R$.

4.3. The contribution of stage structure and viewpoint to aspect construal

Our aspect construal procedure relies on the interaction of two theoretical devices: viewpoints, contributed by tenses, and stage structures, contributed by lexical material – modulo of course the role of adverbial modifiers. Bearing in mind that i) perfective viewpoints introduce CoSs, and require the asserted stage to be temporally bounded, whereas ii) imperfective viewpoints will not require any salient boundary on the asserted Stage, we will formalize viewpoints\textsuperscript{21} as follows:

\begin{align*}
(5) \quad \text{Axiom on perfective viewpoints:} & \quad \text{Perfective}(e) \rightarrow e \subseteq t \\
(6) \quad \text{Axiom on imperfective viewpoints:} & \quad \text{Imperfective}(e) \rightarrow t \subset e
\end{align*}

$t$ being a DRT location time (cf. Kamp & Reyle 1993:514 sqq.), and playing a role similar to that of the Reichenbachian reference point $R$.

Let $(S, R)$ be a verb’s aspectual lexical entry. Viewpoint and adverbial modifiers will first select a stage (using salience) in $S$ and assert it. Asserting a stage $\langle\{e_i, u, v\ldots\}, \{Q(e_i, u, v\ldots)\}\rangle$ will cause the context DRS $K$ to be updated as follows:

\[
\text{update}(K, \langle\{e_i, u, v\ldots\}, \{Q(e_i, u, v\ldots)\}\rangle) = (\langle K_U \cup \{e_i, u, v\ldots\}, \text{Con}_K \cup \{v(e_i), K_i = \langle \emptyset, \{Q(e_i, u, v\ldots)\}\rangle\}\rangle),
\]

where viewpoint is noted $v$. Stages in $S$ that are related either directly or indirectly\textsuperscript{22} to the asserted stage by some relation of $R$ will then be implied. Standard implication will update $K$ in the following manner:

\[
\text{update}(K, \langle\{e_j, u, v\ldots\}, \{Q(e_j, u, v\ldots)\}\rangle) = (\langle K_U \cup \{u, v\ldots\}, \text{Con}_K \cup \{\rho, K_j = \langle\{e_j\}, \{Q(e_j, u, v\ldots)\}\rangle\}\rangle)
\]

where $\rho$ represents a relation between $K_j$ and the asserted stage (e.g., Consec($K_i, K_j$)). Note that in the case of resuttative viewpoints, PStages are de facto implied if they exist, though they are not directly related to the asserted stage. Finally, imperfective viewpoints will cause stages $K_j$ temporally following the asserted stage to be merely possibly implied: $K_j = \emptyset \langle\{e_j\}, \{Q(e_j, u, v\ldots)\}\rangle$.

Figure 3 gives a flavour of the final representation of the aspectual meaning of a sentence\textsuperscript{23}.

\textsuperscript{20} For the sake of clarity, we will reify stage sub-DRSs, noting them $K_i$, although they do not belong directly to the universe of discourse referents of the main DRS. Consec and Target are thus second order predicates.

\textsuperscript{21} We will not offer here a formal treatment of resultative viewpoints for want of space to do so, but see Caudal (1999) for a study of their aspectual properties.

\textsuperscript{22} Transitivity is nevertheless blocked by the modal operator $\emptyset$ (cf. infra).
4.4. Introducing viewpoint operators within DRs

As a matter of fact, SDRT discourse relations (DRs) are aspect-sensitive (Asher 1993, Lascarides & Asher 1993); therefore it sounds sensible to make them viewpoint and stage structure sensitive. Therefore, we will now attempt at redefining how DRs (especially those endowed with an important aspect-temporal / causal content), stage structures and viewpoints interact. Let us begin with Narration. Narration causes textual order to mirror temporal and/or causal order (cf. (7)). Narration is entailed via a defeasible rule and an axiom (cf. i)). Although Narration is usually seen as the most generic entailable DR, it obviously involves a natural sequence of events with CoSs, and therefore requires a perfective viewpoint. We will thus replace i) with ii):

i) Narration: \( \langle \tau, \alpha, \beta \rangle \rightarrow \text{Narration} (\alpha, \beta) \)

Axiom on narration: \( \forall (\text{Narration}(\alpha, \beta) \rightarrow \text{me}(\alpha) < \text{me}(\beta)) \)

ii) Narration: \( \langle \tau, \alpha, \beta \rangle \land \text{perfective}(\text{me}(\alpha)) \land \text{perfective}(\text{me}(\beta)) \rightarrow \text{Narration} (\alpha, \beta) \)

(7) \textit{Mon fils arrive en retard à l'école. La maîtresse le gronda.}

‘My son arrived late at school. The teacher scolded him’.

Contrariwise, Explanation requires a non perfective viewpoint to allow for reversed causal order, as in

(8). We will therefore replace axiom iii) with iv):

iii) Explanation: \( \langle \tau, \alpha, \beta \rangle \land \text{cause} (\text{me}(\beta), \text{me}(\alpha)) > \text{Explanation} (\alpha, \beta) \)

iv) Explanation: \( \langle \tau, \alpha, \beta \rangle \land \text{cause} (\text{me}(\beta), \text{me}(\alpha)) \land \neg \text{perfective}(\text{me}(\beta)) > \text{Explanation} (\alpha, \beta) \)

Note that indicating salience is unnecessary and even irrelevant at this final step of the aspect construal procedure, because an asserted/focused stage has been chosen.
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(8)  
La maîtresse a grondé mon fils. Il est arrivé en retard à l’école.  
‘The teacher scolded my son. He arrived late at school’.

Finally, we will stipulate that Background requires an imperfective viewpoint to allow for overlap between events, rather than use the coercion-based axiom about ‘states overlap’, and replace the usual SDRT axiom v) with vi):

v) States overlap: \( (\tau, \alpha, \beta) \land \text{state}(\text{me}(\beta)) > \text{overlap} (\text{me}(\alpha),\text{me}(\beta)) \)
Background: \( (\tau, \alpha, \beta) \land \text{overlap} (\text{me}(\alpha),\text{me}(\beta)) > \text{Background} (\alpha, \beta) \)
Axiom on Background: \( \forall (\text{Background}(\alpha, \beta) \rightarrow \neg \text{me}(\alpha) < \text{me}(\beta)) \)

vi) Background: \( (\tau, \alpha, \beta) \land \text{imperfective}(\text{me}(\beta)) > \text{Background} (\alpha, \beta) \)
Imperfective overlap: \( (\tau, \alpha, \beta) \land \text{imperfective}(\text{me}(\beta)) > \text{overlap} (\text{me}(\alpha),\text{me}(\beta)) \)

(9)  
Jean ouvrit la porte. La pièce était obscure.  
‘John opened the door. The room was pitch dark’.

5. Conclusion
To summarize, the main features of our proposal are the following. Stage structure has been introduced as a representational, linguistic device (encoded in the lexicon, and modified at structural levels); it comprises several EDRs plus non-mereological relations between the associated event descriptions, as well as several theoretical devices (e.g., salience hierarchies) accounting for the influence of ‘grammatical aspect’ as well as adverbial modifiers on stage structure. This move allows for inferences about them (via EDRs), as well as subevent anaphora/coreference. It offers an explicit treatment of stage structure, as well as an account of the discourse semantic properties of stages, depending on whether they are asserted or implied, with what kind of viewpoint. The latter feature of our approach makes it possible to enrich and optimize aspect-sensitive SDRT axioms and DRs. But our research remains in need of further investigations, both formal and empirical, e.g. with respect to the role of stages and salience in discourse semantics (cf. so-called event coreference phenomena), or aspectual composition (e.g., coercion mechanisms are still very much terra incognita in this respect24).

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24 But see Pustejovsky (1995:111) for a definition of coercion by means of function application; one could associate a set \( \Sigma_\alpha \) of ‘grammaticized’ coercion operators with each viewpoint \( \alpha \).
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Imperfective Aspect and Event Participants in English, Chinese, Korean and Japanese

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1. Introduction
In this paper, we will investigate the effect of event participants in the imperfective aspect systems in English, Chinese, Korean and Japanese. Specifically, we will focus on how different imperfective interpretations denoted by six aspect markers in these languages can be accounted for in terms of the nature of the participants in the event. There are three types of imperfective meanings that can arise from these markers. They are the preliminary, internal stage progressive and resultant state readings. We will show that the availability of a particular imperfective reading is, at least, partially correlated with the nature of the event participants.

The structure of the paper is as follows: First, basic facts about the imperfective systems in the four languages will be introduced. This is followed by a brief discussion of some previous studies on the imperfective systems of these languages. We will show that these studies can only provide a partial picture of what's going on. The important question of why variations exist across languages is not addressed. The present paper is our attempt to address this issue. We propose that the imperfective readings are triggered by the agent / theme-orientendness of these markers. Based on our proposal, we will analyze the imperfective systems of four languages in Sections 3 and 4. Finally, we will conclude our discussion by raising some theoretical implications of this analysis.

2. The Imperfective Systems of English, Chinese, Japanese and Korean – the basic facts
Before we describe the basic facts about the imperfective systems of four languages, it is necessary for us to provide our assumptions on the concept of imperfectivity. According to Smith (1991), as opposing to perfective viewpoints, imperfective aspects are the viewpoints that focus on the stages excluding the initial and final endpoints of the event. Under this definition, three imperfective viewpoints can arise. They are the imperfectives with (a) preliminary stage focus

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1 I would like to thank Jun Da, Jiu-Shiung Wu (Mandarin), Makiko Irie, Ritsuko Kataoka, Rika Kato (Japanese), Chisung Oh, Incheol Choi and Jeong-yeon Kim (Korean) for providing the grammatical judgments, comments and relevant examples in Chinese, Japanese and Korean. All errors are mine.
(preliminary), with (b) internal stage focus (progressive) and with (c) the resultant state focus (resultative). They are illustrated in the temporal schema (1) below:

(1) Three types of imperfective viewpoint (I: Initial point; F: Final endpoint)

\[
\begin{array}{ccc}
(a) \text{ Preliminary} & (b) \text{ On-going} & (c) \text{ Resultative} \\
\end{array}
\]

In the following section, we will illustrate these three types of imperfective viewpoints denoted by six aspect morphemes. We will start with the more familiar case of English -ing form.

2.1. English -ing

The main English imperfective is denoted by the morpheme -ing (Smith 1991), which is usually called the progressive form. With the -ing form, all three possible imperfective readings, that is, preliminary, progressive and resultative, can arise. (2) to (5) below illustrate these three possible readings.

(2) Peter was reading a book.  
(3) Peter was reaching the top of the hill.  
(4) Peter was sitting on the chair.  
(5) Peter was wearing an overcoat.  

(internal stage progressive)
(preliminary reading)
(resultative)
(ambiguous: progressive / resultative)

Depending on the verb type, -ing attached to a verb may give rise to certain imperfective interpretation. As is clear from the example, (2) denotes progressive reading. (3) means “Peter was going toward the top of the hill.” He was almost at the top but was not yet there. This is the preliminary reading of -ing. In (4) and (5), -ing denotes resultative meaning. (5) is ambiguous between progressive and resultative. The temporal schema of the English imperfective -ing form is shown in (6) below:

(6) Possible imperfective interpretations of English -ing

\[
\begin{array}{ccc}
(a) \text{ Preliminary} & (b) \text{ Progressive} & (c) \text{ Resultative} \\
\end{array}
\]

(example (3))
(examples (2) and (5))
(examples (4), (5))

\[\text{2 The availability of a particular imperfective reading depends largely on the verb type (e.g. achievement verbs favor preliminary reading and accomplishment verbs favor internal stage progressive reading with -ing). The present paper mainly concentrates on the effect of event participants on the imperfective interpretation. We will not discuss this issue in full length. For further details, please refer to Du (2000).}\]
2.2. Chinese - zai and zhe
There are two imperfective markers in Mandarin Chinese, namely, zai and zhe. In the following sections, we will discuss the progressive reading denoted by zai and the resultative one denoted by zhe.

2.2.1. Internal stage progressive zai
Zai is a typical progressive marker which focuses on the internal stage of an event. Consider the following example for illustration:

(7) ta zai xie xin
    3sg. PROG write letter
    ‘He is writing a letter.’

(internal stage progressive)

Unlike the English imperfective -ing, neither preliminary nor resultant state focus is possible with zai. Consider the following examples:

(8) *ta zai dao le
    3sg. PROG reach PFV
    ‘He is arriving.’

(preliminary reading not possible cf. Eng example (3))

(9) *ta zai zuo zai yi shang
    3sg. PROG sit at chair on
    * ‘He is sitting on the chair.’

(resultative not possible cf. English example (4))

(8) and (9) are ill-formed. Resultative and preliminary readings are not available with zai with which only the internal stage focus is possible. Consider the following example for further illustration:

(10) ta zai chuan da yi
    3sg. PROG wear big coat
    *‘He is wearing an overcoat.’
    ‘He is putting on an overcoat.’

(only progressive reading)

The only available reading in (10) is a progressive one. This is different from the corresponding English example in (5) in which the sentence is ambiguous between progressive and resultative.

2.2.2. Resultative zhe
The Chinese imperfective aspect marker zhe generally denotes a resultant state of the event. This is shown in (11) and (12) below:

(11) ta zuo zhe zai zhuo shang
    3sg. sit RES at table on
    ‘He is sitting on the table.’

(resultative reading)

(12) ta chuan zhe da yi
    3sg. wear RES big coat
    ‘He is wearing the overcoat. (The coat is on his body).’

(resultative reading)
Comparing using the progressive marker *zai in (9) and (10) and the marker *zhe in (11) and (12), we can note that *zhe denotes resultative meaning. Neither progressive" nor preliminary reading is available with *zhe. Consider the following examples for illustration:

(15) *ta  da  zhe  qiu
3sg. hit RES ball
* 'He is playing ball.'

(16) *ta  dao  zhe  nar
3sg. reach RES there
* 'He is arriving there.'

The following temporal schema summarizes the behavior of the two Chinese imperfective markers *zai and *zhe.

(17) Possible interpretations of the Chinese imperfective *zai and *zhe

<table>
<thead>
<tr>
<th>za</th>
<th>zhe</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>F</td>
</tr>
<tr>
<td>/ / / / / / / /</td>
<td></td>
</tr>
<tr>
<td>Progressive</td>
<td>Resultative</td>
</tr>
<tr>
<td>(examples (7) and (10))</td>
<td>(examples (11), (12))</td>
</tr>
</tbody>
</table>

2.3. Korean - *ko-iss and *e-iss
Korean has two temporally unbounded imperfective markers *ko-iss and *e-iss*. *Ko-iss* is a more general imperfective which can focus on three temporal portions of the event. *E-iss*, on the other hand, is a resultative aspect marker.

2.3.1. General imperfective *ko-iss
With *ko-iss*, three possible imperfective interpretations (preliminary, progressive and resultative) can arise. These meanings are illustrated in the following examples:

(13) ta  pao  zhe  ne
3sg. run RES/PROG SFP
'He is actually running.'

(14) ta  pai  zhe  shou  chang  ge
3sg. clap RES/PROG hand sing song
'He was clapping hands while singing.'

We suspect this particular progressive reading triggered by *zhe is due to the stative nature of the marker. Since this progressive reading only occurs under very restricted environments (namely, when the sentence is ended by the particle *ne and when it is in some kind of subordinate construction), we will leave the issue to future research studies.

2 In fact, under certain marked environment, the marker *zhe, combined with an eventive verb, can denote a progressive meaning. For example,

(13) ta  pao  zhe  ne
3sg. run RES/PROG SFP
'He is actually running.'

(14) ta  pai  zhe  shou  chang  ge
3sg. clap RES/PROG hand sing song
'He was clapping hands while singing.'

We suspect this particular progressive reading triggered by *zhe is due to the stative nature of the marker. Since this progressive reading only occurs under very restricted environments (namely, when the sentence is ended by the particle *ne and when it is in some kind of subordinate construction), we will leave the issue to future research studies.

4 Korean has several temporally bounded imperfective markers such as *nun.
Imperfective Aspect and Event Participants in English, Chinese, Korean...

(18) John-i cip-ul cis-ko-iss-ta
    John-NOM house-ACC build-IMPF-Decl
    'John is building a house.' (progressive)

(19) kicha-ka tochakha-ko-iss-ess-ta
    train-Nom arrive-IMPF-Ant-Decl
    'A train was arriving.' (preliminary reading)

(20) Mary-ka cham yeypun os-ul ip-ko-iss-ta
    Mary-NOM very pretty clothes-ACC put-on-IMPF-Decl
    'Mary is wearing very pretty clothes.' (progressive / resultative)

As shown in the above examples, we can note that ko-iss behaves very similarly with the English -ing which can denote three imperfective readings. Special attention should be paid to the resultative reading of this marker. This kind of reading can only arise with a particular verb type, namely, the resultative accomplishment (Ahn 1995). This verb class includes verbs of posture and location. The resultative reading that is related to the English -ing also occurs with a similar set of verbs.

2.3.2. Resultative e-iss
The Korean e-iss focuses on the resultant state of intransitive, telic events. Preliminary and internal stage progressive readings are not possible with this marker. The behavior of e-iss is illustrated in (21) and (22) below.

(21) kicha-ka tochakha-e-iss-ta
    train-NOM arrive-RES-Decl
    'The train is in the state of having arrived.' (resultative)

(22) * John-i cip-ul ci(s)-e-iss-ta
    John-NOM house-ACC build-RES-Decl
    * 'John is building a house / has built a house.'

The behavior of e-iss is in fact very similar to that of the Chinese zhe except that zhe can also occur with certain transitive verbs to denote resultative meaning whereas e-iss cannot.

The possible interpretations of Korean ko-iss and e-iss are shown in the temporal schema (23) below.

(23) Possible interpretations of Korean imperfective ko-iss and e-iss

```
-ko-iss

Preliminary
(example (18))

Progressive
(example)

Resultative
(examples (20), (21))
```

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2.4. Japanese - *te-iru*

The Japanese imperfective marker *te-iru* can focus on the internal stage or the resultant state. Preliminary reading is not available. Consider the following examples for illustration.

(24) Ani-wa kuroi yoohuko-o ki-*te-iru*  
brother-TOP black suit-ACC put-on-IMPF  \(\text{ambiguous:}\)  \(\text{progressive / resultative}\)

(25) Taroo wa shin-*de-iru*  
Taroo TOP die-IMPF  \(\text{(resultative, preliminary reading not available)}\)

(26) densen ga kirete-*iru*  
power-line NOM cut\(_{\text{intr}}\)-IMPF  \(\text{(resultative)}\)

(27) Taroo wa densen o kitte-*iru*  
Taroo TOP power-line-ACC cut-IMPF  \(\text{(progressive)}\)

In example (24), the sentence can denote either progressive or resultative meaning. (25) illustrates that, with *te-iru*, the resultative interpretation is available with the achievement verb. Sometimes, transitivity plays a role in the imperfective interpretation of *te-iru*. (26) and (27) show that, with *te-iru*, the intransitive version of the verb *kireru* ‘to cut’ in (26) can only allow for resultative reading whereas the transitive version of the verb *kiru* ‘to cut’ most naturally allows for progressive interpretation\(^5\). The temporal schema of the Japanese imperfective *te-iru* is given in (28).

(28) Possible interpretations of Japanese imperfective *te-iru*

\[
\begin{array}{c|c|c}
\text{te-iru} & \text{Progressive} & \text{Resultative} \\
\text{I} & \text{F} & \text{(examples (26) and (29)) (examples (27), (28))}
\end{array}
\]

2.4. Summary

The imperfective viewpoints of six morphemes in the four languages are summarized in the following temporal schema.

---

\(^5\) Many of the Japanese verbs have transitive and intransitive counterparts. For example, the verb for ‘to cut’ has two forms: *kireru* ‘to cut\(_{\text{intr}}\)’ (in example (26)) and *kiru* (in example (27)) ‘to cut\(_{\text{tr}}\)’ which are intransitive and transitive respectively.
Summary of imperfective viewpoints of English, Chinese, Korean and Japanese on a temporal schema

(i) English \(-ing\), Korean \(ko\text{-}iss\)

(ii) Chinese \(zai\)

(iii) Chinese \(zhe\), Korean \(e\text{-}iss\)

(iv) Japanese \(te\text{-}iru\)

Preliminary \(\sqrt{\quad}\)
Progressive \(\sqrt{\quad}\)
Resultative \(\sqrt{\quad}\)

Given a particular event: (i) English \(-ing\) and Korean \(-ko\text{-}iss\) can focus on one of the three imperfective viewpoints; (ii) Chinese \(zai\) can only focus on the internal stage to denote progressive reading; (iii) Korean \(e\text{-}iss\) and Chinese \(zhe\) can focus on the resultant state to denote resultative meaning; (iv) Japanese \(te\text{-}iru\) can focus on either the internal stage or the resultant state.

Merely studying the imperfective systems of the four languages from the above temporal schema is not enough. There are some more intricate co-occurring restrictions and properties that are more note-worthy. The following table summarizes, in more details, the imperfective systems of four languages under discussion.

Summary table of the possible imperfective interpretations of six aspect markers in four languages

<table>
<thead>
<tr>
<th>Language</th>
<th>Preliminary</th>
<th>Progressive</th>
<th>Resultative</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (-ing)</td>
<td>(\sqrt{\quad}) (with achievements)</td>
<td>(\sqrt{\quad})</td>
<td>(\sqrt{\quad}) (with verbs of location and posture (e.g. to sit))</td>
</tr>
<tr>
<td>Chinese (zai)</td>
<td>(\times)</td>
<td>(\sqrt{\quad})</td>
<td>(\times)</td>
</tr>
<tr>
<td>Chinese (zhe)</td>
<td>(\times)</td>
<td>(\times)</td>
<td>(\sqrt{\quad}) (mostly with verbs of posture and location and some psyche verbs such as ai ‘love’))</td>
</tr>
<tr>
<td>Korean (ko\text{-}iss)</td>
<td>(\sqrt{\quad}) (with achievements)</td>
<td>(\sqrt{\quad})</td>
<td>(\sqrt{\quad}) (restrictions same as English)</td>
</tr>
<tr>
<td>Korean (e\text{-}iss)</td>
<td>(\times)</td>
<td>(\times)</td>
<td>(\sqrt{\quad}) (only with intransitive verbs)</td>
</tr>
<tr>
<td>Japanese (te\text{-}iru)</td>
<td>(\times)</td>
<td>(\sqrt{\quad}) (commonly with transitives)</td>
<td>(\sqrt{\quad}) (commonly with intransitives)</td>
</tr>
</tbody>
</table>

A very important preliminary conclusion that can be drawn from the above discussions is that despite the common imperfective quality of these markers, each of them exhibits its own set of imperfective reading(s). They all denote
imperfective viewpoints but the foci of their viewpoints vary from marker to marker and from language to language.

Further questions that will be addressed in this paper are: Why is there a variation among languages? Are there any other correlations / generalizations that can be drawn other than the temporal (or aspectual) one? Are there any more fundamental differences underlying these variations.

3. Previous Studies

Before we propose our solution, we will briefly discuss some of the previous studies that attempt to address some of the observations that we made above.

There are many studies that investigate the aspectual systems of different languages. For example, Dahl (1985) studies tense and aspectual systems of more than 60 languages. He extensively classifies aspects into different categories. His study provides very useful information about the types of aspectual categories that can be present in languages. His work, however, does not clearly provide how and why languages vary in particular ways.

Smith’s (1991) study, on which the present study heavily based, on the aspectual systems is one of the most important studies which addresses the cross-linguistic issue of the aspectual systems. She proposes that aspectual viewpoint is a “parameter” in the Universal Grammar and languages vary with respect to how a particular viewpoint is interpreted. Following Smith’s work, Ahn (1995) and Shirai (1999) work on the imperfective systems of Korean and Japanese and they make a similar claim that languages do vary with respect to which part of the temporal framework a particular imperfective marker focuses. For example, Shirai claims that Korean ko-iss focuses on the preliminary stage of an event while Japanese te-iru focuses on the resultant state, Ahn claims e-iss is compatible only with intransitive verbs while ko-iss is compatible with transitive. These seem to be adequate generalizations. However, we may still want to know how and why the foci of these imperfective markers vary. What other generalizations about the language one can make with such kind of cross-linguistic variation? From our discussions of the imperfective systems so far, we may note that the concept of transitivity may play a role in the imperfective viewpoint interpretation. Smith’s Two-component theory on aspect does not take concepts such as transitivity into account. In the remaining portion of the paper, we will attempt to give a partial answer to the questions we raised here.

In the next section, we will begin with our proposal which attempts to look into the imperfective phenomenon from a ‘non-temporal’ perspective: the event participants. We will argue that the six imperfective morphemes have different degrees of agent- / theme- orientedness which play a crucial role in the aspectual interpretation of a situation.

4. Our Proposal – Event Participants and Agent- / Theme-orientedness

Let us reiterate our present task: we would like to account for the cross-linguistic variations of the imperfective systems in terms of the nature of the events and the involving event participants. We will start from what we have so far: the temporal schema which illustrates three imperfective viewpoints. From the temporal schema, we can imagine a possible interaction among event participants at
different stages of the event. For a typical event which involves participants such as an agent and/or a theme, some event participant may become more prominent than the other at a particular stage. Consider the following figure:

(31) The possible focused participants at different stages of the event

As shown in the above figure (32), the event can be divided into three zones: Zones A, B and C. In Zone A in which the preliminary aspectual reading is possible, the agent is the most prominent participant in the situation (in focus). This is intuitively sound especially for achievement verbs in which one entity imposes some action such that a change of state of the other entity occurs. Before the change of state occurs, the agent is the most dynamic and thus prominent.

At the intermediate stage, that is Zone B, the agent has already started to impose some effect with respect to the event and the theme is undergoing a corresponding change due to the action. At this stage, both the agent and the theme can be in focus because both participants are in a ‘changing stage’.

At the stage after the final endpoint of the event, that is, Zone C in the given figure, the event has come to an end. The theme has finished undergoing the corresponding change. Naturally, the agent would be out of the picture at this point. The theme, in which the resultant state is held, is thus in focus.

This is how the participants are involved in the event on the one side. The imperfective markers, on the other side, are also affected by the event participants. We propose that the imperfective aspect markers in different languages vary with respect to their affinity to particular event participants. We call it the agent-/theme-orientedness of the markers. A particular imperfective marker may be an agent-oriented one and allows for a viewpoint with which the agent is in focus. Due to the limited length of this paper, we will very briefly analyze six morphemes below.

5. The analysis – imperfective morphemes with different degrees of agent-/theme-orientedness

According to our proposal, imperfective markers have different degrees of agent-/theme-orientedness. In this section, we will discuss each imperfective marker in terms of this criterion. We start from the simplest case. Korean e-iss and Chinese zhe, which allows for only resultative reading, is a theme-only-oriented marker. The marker enables only the affected entity, that is, the theme, to be visible in a

---

6 In this paper, the concepts of agent and patient are loosely defined. Our present study is on event participants is based on a most typical eventive situation in which an entity which we call 'the agent' is imposing some action or change to another entity which we call 'the theme'. Due to the limited length of the paper and in order to avoid unnecessary controversy, we will leave a more precise definition to future studies.
given situation. The resultant state after the final endpoint, Zone C, in which the theme would be in focus, is the only possible interpretation. The theme-orientedness of the markers is supported by the fact that volitional or intentional agent is generally not compatible. Consider the following examples in Chinese for illustration.

(32) *Peter gua zhe yi zhang hua zai qiang shang
Peter hang RES one CLS picture at wall on
‘Peter is hanging / has hanged a picture on the wall.’

(33) Nei zhang hua gua zhe zai qiang shang
that CLS picture hang IMPF at wall on
‘That picture is hanging on the wall.’

(34) Ta zuo zhe zai zhuan shang
3sg. sit RES at desk on
‘He is sitting on the desk.’

(32) is ill-formed because, according to our proposal, zhe is an theme-only-oriented marker and it is incompatible with an agent. When an agent is absent, the sentence is perfect as shown in (33). There may be one possible exception. (34) is perfect despite the fact that the agent (the person who is in the sitting position) is visible. In fact, this exception is well explained under our framework. In such kind of situation as zuo ‘to sit’ and chuan ‘to wear’, the agent is actually identical to the theme, the affected entity. Thus, even though the agent is visible, the situation can well be interpreted as having the theme in focus.

For the Korean case, e-iss is incompatible with transitive predicates at all. It is reasonable to assume that in a transitive construction. An agent is thus generally present. Then, the incompatibility between e-iss and transitive verbs can also be accounted for in terms of the theme-only-orientedness of the marker.

Next, English –ing and Korean ko-iss which allow for all three imperfective readings, are agent-oriented markers. They have affinity to the agent in an event. With such markers, preliminary stage and internal stage progressive are the possible imperfective readings because the agent is in focus in these two portions of the temporal schema (Zones A and B in (31)). The so-called resultative reading that arises from these markers (cf. English examples (4), (5), Korean example (20)) is due to the fact that the agent in the given event (e.g. the event of ‘sitting down’) is also the affected entity (the theme). Jacobsen (1992) singles out this set of verbs and calls them ‘reflexive verbs’.

Japanese te-iru, on the other hand, is a theme-oriented marker. It can thus focus on either the internal stage or resultant state. It is because in these two temporal zones (Zones B and C in (31)), the theme is visible. Recall that we just claimed Chinese zhe and Korean e-iss are theme-only-oriented markers. A question is raised: what is the difference between te-iru and these two markers? The main difference is: where zhe and e-iss have affinity to only the theme in the situation and thus triggers resultative interpretation, te-iru has affinity to the theme regardless the availability of an agent in the given sentence. Therefore, an agent can be present with te-iru and Zone B is also a possible portion where te-iru
Imperfective Aspect and Event Participants in English, Chinese, Korean...

can have an imperfective interpretation. Compare the following well formed Japanese example with the corresponding Chinese example (32) above:

(35) piitaa-ga kabe-ni e-o kaket-te-i-ru
     peter-NOM wall-LOC pic-ACC hang IMPF
     ‘Peter is hanging the picture on the wall.’

The above example shows that te-iru is compatible with agent (i.e. ‘Peter’ in (35)). It is theme-oriented marker which does not exclude an agent in the situation.

Finally, Chinese zai, which allows only for progressive interpretation, is an agent-and-theme-oriented marker. It makes both the agent and the theme visible in the event, specifically.

The agent-/theme-orientedness of six imperfective markers are summarized in (36) below:

(36) Summary Table of the degrees of agent-/theme-orientedness of six markers

<table>
<thead>
<tr>
<th></th>
<th>Preliminary Stage</th>
<th>Internal stage</th>
<th>Resultant Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agent in focus</td>
<td>Agent/theme in focus</td>
<td>Theme in focus</td>
</tr>
<tr>
<td>(1)</td>
<td>Agent-oriented imperfective: English –ing and Korean ko-iss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>Theme-oriented imperfective: Japanese te-iru</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>Agent-and-theme-oriented imperfective: Chinese zai</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>Theme-only-oriented imperfective: Chinese zhe and Korean e-iss</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Conclusion and Remaining Issues
In this paper, we proposed that at different stages of the event, certain event participants (agent and/or patient) are more prominent than the rest. Imperfective markers, in a similar way, have a close relationship with event participants. We proposed that the different degrees of agent-/theme-orientedness of the markers constitute the cross-linguistic variations in the imperfective interpretations.

One important question we would like to address is: why do imperfectives, but not perfectives, have such a close relationship with the event participants? If our proposal is adequate, our answer would require us to go back to the basic concept of imperfectivity: imperfective viewpoints, unlike perfective, present part of the situation, with no information about its endpoints. Event endpoints are
invisible. The viewpoint focuses on the portion in between, before or after the endpoints. With both endpoints being invisible, what would be ‘visible’ in such viewpoint aspect? It seems that what remains visible are the event participants. We can imagine there a natural tendency for the imperfective viewpoint to provide some information on the only visible elements in the event: the participants. This may explain why the event participants play such a crucial role in the imperfective interpretation of the corresponding markers.

One final point we would like to address is that our present proposal focuses mainly on the effect of event participants on the imperfective interpretation. We definitely do not want to say that the event participants are the sole players. What we have shown is just the tip of the iceberg. We have so far simplified the phenomenon to a great extent in order to present this simple picture. The real phenomenon is far more complex. There is much more to explore with respect to the cross-linguistic issue of the imperfective systems. We will leave these many issues to future studies.

References


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1. Two kinds of adjectival passives
The adjectival passive construction that is traditionally called ‘Zustandspassiv’ ('state passive') in German seems to have the same syntactic and semantic properties as its English cousin, except that it is easier to identify. German state or adjectival passives select the auxiliary sein ('be'), and are therefore clearly distinguished from verbal or 'Vorgangs'-passives ('process passives'), which use the auxiliary werden ('get', 'become'). In spite of their appearance, German state passives do not form a homogenous class, however. There are two important subclasses that behave differently with respect to the adverbial immer noch ('still'), for example:

**Target state passives**

1. a. Die Geisslein sind immer noch versteckt.
   The little goats are still hidden.

   b. Die Reifen sind immer noch aufgepumpt.
   The tires are still pumped up.

   c. Der Deckel ist immer noch abgeschraubt.
   The lid is still screwed off.

   d. Das Gebäude ist immer noch geräumt.
   The building is still evacuated.

   e. Die Ausfahrt ist immer noch versperrt.
   The driveway is still obstructed.

---

1 Thanks to the Berkeley Linguistic Society for inviting me to an enjoyable conference. In particular, I would like to thank Jeff Good for getting me to write this paper at all. Discussions with Edith Doron while I was a guest at the Center for Advanced Studies at the Hebrew University in Jerusalem in January (1998) were crucial to the development of some of the ideas contained in this paper.

2 In the terminology of Nedjalkov and Jaxontov (1988), target state passives would be resultatives, and resultant state passives would be perfects. The observation that the behavior of still brings out the difference between resultatives and perfects is due to Nedjalkov and Jaxontov.
Resultant state passives

(2) a. Das Theorem ist (*immer noch) bewiesen.
   The theorem is (*still) proven.

   b. Der Briefkasten ist (*immer noch) geleert.
   The mailbox is (*still) emptied.

   c. Die Wäsche ist (*immer noch) getrocknet.
   The laundry is (*still) dried.

   d. Die Gäste sind (*immer noch) begrüsst.
   The guests are (*still) greeted.

   e. Die Töpfe sind (*immer noch) abgespült.
   The pots are (*still) washed up.

The terms ‘target state’ and ‘resultant state’ I used as labels for the two types of state passives are borrowed from Parsons (1990), who explains the difference between the two kinds of states as follows:

Resultant states
"For every event e that culminates, there is a corresponding state that holds forever after. This is "the state of e’s having culminated," which I call the "Resultant state of e," or "e’s R-state." If Mary eats lunch, then there is a state that holds forever after: The state of Mary’s having eaten lunch"\(^3\).

Target states
It is important not to identify the Resultant-state of an event with its "target" state. If I throw a ball onto the roof, the target state of this event is the ball’s being on the roof, a state that may or may not last for a long time. What I am calling the Resultant-state is different; it is the state of my having thrown the ball onto the roof, and it is a state that cannot cease holding at some later time"\(\ldots\) "For a large number of verbs, there is a "typical" independently identifiable state that its object is in after the verb is true of it. If the state is transitory, then we come to use the adjective form of the past participle to stand for the transitory state instead of for the permanent resultant state. For example, anything that is cracked and then not repaired is in a state that is easy to identify—until the repair \(\ldots\)\(^4\).

The target state passives in (1) describe states that are in principle reversible, hence can be transitory, and this is what the adverbial *immer noch* (‘still’) requires. German *immer noch*, like English *still* is deviant when combined with predicates that describe states that are irreversible. The resultant state passives in (2) convey that a contextually salient event of the kind described by the participle

\(^2\) Parsons (1990), 234.
\(^4\) Parsons (1990), 235.
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is over by now, the reference or topic time. Assuming, as does Parsons, that there is a state corresponding to an event’s being over, that state is irreversible and has to hold forever after. Once an event is over, it is over for good. You cannot undo an event’s having happened. If the passives in (2) describe resultant states, we have an explanation for why they are incompatible with adverbs like still.

While the immer noch test works well in most cases, it is not absolutely reliable. Look at the following examples:

(3) a. * The feast is still over.
   b. * The homework is still done.
   c. # Melchiades is still dead.
   d. # The potatoes are still cooked.

(3a) and (3b) are semantically anomalous and beyond repair. (3c) is fine when uttered in a context where dead people are assumed to come back to life. (3d) sounds pretty bad, yet in a context where cooked potatoes might turn raw again after a while, (3d) would feel fine. When a state passive passes the immer noch test, we can safely conclude that we have a target state participle. If it doesn’t seem to pass, however, we have to make sure, we aren’t looking at cases like (3c) or (3d). With a true resultant state passive, failing the immer noch test has to be a matter of meaning, not a matter of contingent fact.

Parsons proposed the resultant state interpretation as an interpretation for the English perfect construction. If this is right, we expect the state passives in (2) to share the aspectual properties of the verbal passives in (4), which is the case:

(4) a. The theorem has been proven.
   b. The mailbox has been emptied.
   c. The laundry has been dried.
   d. The guests have been greeted.
   e. The pots have been washed.

If the German resultant state passives in (2) are perfect constructions, we might be tempted to suspect that they might just be perfect forms of verbal passives with the auxiliary werden deleted:

(5) a. Das Theorem ist bewiesen.  Adjectival passive
    The theorem is proven.

   b. Das Theorem ist bewiesen worden.  Verbal passive, perfect
    The theorem is proven gotten
    The theorem has been proven.

The proposal that the passives illustrated in (2a)–(2e) are just perfect forms of verbal passives with the auxiliary werden deleted has surfaced from time to time
in the linguistic literature on German⁵, yet does not seem tenable. Look at the following examples:

(6) a. Die Kinder sind (*immer noch) gewaschen.
    The children are still washed

    b. Die Kinder sind gewaschen worden.
    The children are washed gotten
    The children have been washed.

(6a) is a resultant state passive, and (6b) is the perfect form of the corresponding verbal passive. The crucial observation is that there is a subtle meaning difference between (6a) and (6b). (6a) is compatible with the children having washed themselves, (6b) is not. Somebody must have washed them⁶. Baker, Johnson, and Roberts (1989) take incompatibility with self-action to be evidence for the obligatory presence of an implicit impersonal pronoun realizing the verb’s external argument in verbal passives. The meaning difference between (6a) and (6b) might then boil down to the obligatory presence of an unpronounced agent argument in (6b), but not in (6a). I conclude that resultant state passives have perfect aspect, but they are not just elliptical versions of perfect forms of verbal passives.

Resultant state passives are marginally acceptable with activity verbs:

(7) a. Die Katze ist schon gestreichelt.
    The cat is already petted

    b. Dieser Kinderwagen ist schon geschoben.
    This baby carriage is already pushed.

(7a) and (7b) sound bizarre out of the blue, but as soon as we impose a ‘job is done’ or ‘that’s over’ interpretation, they become fine. For (7a), imagine a scenario where it is my job to pet my neighbor’s cat once a day while he is on vacation. A natural setting for (7b) would be a factory that produces baby carriages and employs workers whose job it is to push new baby carriages a few times to test their wheels.

Resultant state passives can also be formed from impersonal, idiomatic, and resultative constructions:

(8) a. Ihm sind die Leviten gelesen. Idiom
    Him(dat.) are the Leviticus (nom.plur.) read
    ‘He was scolded.’

---

⁵ See Rapp (1997) for more discussion of this point.
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b. Die Teekanne ist leergetrunken. The teapot is empty-drunk
   ‘The teapot is drunk empty.’

   Resultative

c. Ihm ist geholfen. Him(dat.) is helped.

   Impersonal

The only verbs that aren’t ever acceptable in any kind of state passive in German are certain stative verbs, including the old preteropresents:

(9) a. * Dieses Haus ist besessen. This house is owned.

b. * Die Antwort ist gewusst. The answer is known.

The class of verbs that can form target state passives in German coincides with the class of verbs that allow modification by für-PPs:

(10) a. Die Mutter hat die Geisslein für ein paar Stunden versteckt. The mother has the little goats for a few hours hidden
   Implies: the little goats were hidden for a few hours.

b. Wir werden das Boot für ein paar Stunden aufpumpen. We will the boat for a few hours up-pump
   Implies: the boat will remain inflated for a few hours.

(11) a. * Du kannst die Gäste für eine Stunde begrüssen. You can the guests for an hour greet
   ‘You can greet the guests for an hour’.

b. * Wir werden den Briefkasten für drei Tage leeren. We will the mailbox for three days empty
   ‘We will empty the mailbox for three days’.

When a PP headed by für modifies a verb and the result is grammatical, the only reading available is one where a claim is made about the length of a target state characterized by the verb. In Generative Semantics and more recent syntactic frameworks relying on head movement, similar facts in English have been taken as evidence for lexical decomposition of accomplishment verbs in the syntax. At some level of syntactic representation, the relevant verbs would appear as decomposed into an eventive and a stative component, and consequently, PPs

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7 See e.g. Dowty (1979), who credits Robert Binnick with the earliest observation of those facts. Interestingly, the adverb again behaves differently from für-PPs. It can ‘access’ target states in compositional causatives as well.
could in principle operate on the stative component alone. The German data illustrated in (10) and (11) speak against a syntactic decomposition analysis of accomplishment verbs, however. On a syntactic decomposition analysis, it would be a rather odd fact that compositional causatives like *leeren* ('empty'), for example, do not allow other operations to see the target state they characterize: they do not have target state passives and cannot be modified by *für*-PPs. On the other hand, there are many causative verbs with non-compositional prefixes that have target state passives and can be modified by *für*-PPs. Take *auf-pumpen* ('pump up'), for example. Morphologically, *auf-pumpen* consists of the verb *pumpen* ('pump'), and the non-compositional prefix *auf-*. If *aufpumpen* had to be syntactically decomposed into a stative and an eventive component, the eventive component could be contributed by *pumpen*, but the stative component couldn't be contributed by *auf-*. In isolation, the prefix *auf-* doesn't have a denotation at all, hence couldn't possibly contribute a target-state property. In this case, then, the syntactic decomposition needed for accessing the target state property of *aufpumpen* would have to go right against that verb's morphological make-up. It seems, then, that we have to be able to access the target state property characterized by a verb without relying on syntactic decomposition. The following section explores a particular way of doing so.

2. Building statives
We have seen that when we classify verbs according to their ability or inability to make a target state property available to other operations, we find verbs that are traditionally classified as 'accomplishment verbs' in both subgroups. What is it about lexical representations that tells the semantic computation system that verbs are not all alike with respect to the availability of a target state property? We saw that syntactic decomposition doesn't seem an option because in many cases, the required decomposition does not match the morphological structure of the verbs in question. In Kratzer (1998), I proposed that those verbs that allow target state passives and modification by *für*-PPs are verbs that are constructed from stems that have both an event argument (the usual Davidsonian argument) and a target state argument⁸. Such stems can be used to build verbs or adjectives and should therefore be unspecified for syntactic category. The logical representation for the category-neutral stem *aufpump*- would then be (12):

\[
(12) \quad \lambda x \lambda s \lambda e [pump(e) \& event(e) \& inflated(x)(s) \& cause(s)(e)]
\]

Following Marantz (1984) and Kratzer (1996), I am assuming that external arguments are not true arguments of their verbs⁹. Consequently, the stem

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⁸ Piñon (1999) drew the same conclusion on the basis of the behavior of German *für*-PPs.
⁹ Crucially, I am not assuming that the non-state argument of adjectives is an external argument. In German, the overt subjects in copula constructions (including adjectival passives) can have the syntactic properties of external or internal arguments. I think this fact is best explained in terms of properties of the copula *be*, following Diesing (1992). According to Diesing, when the copula is a control copula, the overt subject of the construction is an argument of the copula that is linked to an unpronounced internal argument of the adjective via a control relation. When the copula is a
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\textit{aufpump}- has just a direct object argument in addition to its state and event arguments. Given (12), the logical representation for the phrase \textit{das Boot aufpump}- (‘pump up the boat’) is (13):

\begin{equation}
\lambda s \lambda e \left[ \text{pump}(e) \& \text{event}(e) \& \text{inflated}(\text{the boat})(s) \& \text{cause}(s)(e) \right]
\end{equation}

If the state argument can remain visible for a little while during a syntactic derivation, modifiers like \textit{für}-PPs can see it and impose conditions on the states described. Target state participles can be created at this stage as well. Their logical representations are derived as follows\(^{10}\):

\begin{align*}
\text{Building a stative (first way, phrasal case)} \\
\text{Stem+object: } & \lambda s \lambda e \left[ \text{pump}(e) \& \text{event}(e) \& \text{inflated}(\text{the boat})(s) \& \text{cause}(s)(e) \right] \\
\text{Stativizer: } & \lambda R \lambda s \exists e R(s)(e) \\
\text{Output: } & \lambda s \lambda e \left[ \text{pump}(e) \& \text{event}(e) \& \text{inflated}(\text{the boat})(s) \& \text{cause}(s)(e) \right]
\end{align*}

According to (14), the stativity of target state participles is the result of existentially quantifying the Davidsonian argument of a category-neutral predicate that has an additional target state argument.

Lieber (1980) has argued that what makes adjectival participles adjectival in English and German, is a zero suffix attached outside of the visible participle morphology. This is why verbal and adjectival passive participles show the same allomorphy in those languages. If Lieber is correct, the stativizer in (14) might be the denotation of a zero suffix. Alternatively, we could think of the stativizer as a possible denotation for the syntactic category label ‘A’ itself, and we would then have adjectival participles of the form \(\text{[ge-}......\text{-en}]_A\). On either proposal, the overt participle morphology would be meaningless, and its only function would be to license the absence of verbal inflection. If the external arguments of verbs are introduced by verbal inflection, as argued in Kratzer (1996), lack of verbal inflection implies absence of external arguments. This explains why in adjectival passives, the verb’s external argument is truly missing. It’s not that it has been eliminated or suppressed. It was never there to begin with. A parallel explanation can be given to the absence of accusative case, provided that it, too, depends on the presence of verbal inflection\(^{11}\).

The stativizer introduced in (14) operates over phrases, rather than lexical items. This is not necessarily so, but it is a possibility, as I will show shortly.

\textsuperscript{10} Here and in what follows, I take logical representations to be expressions of an intensional typed \(\lambda\)-calculus with the basic types \(t\) (propositions), \(e\) (entities), \(s\) (states, events), and \(i\) (intervals of times). As for variables, ‘\(x\)’ ranges over entities, ‘\(e\)’ over eventualities, including events proper and states, ‘\(s\)’ ranges over states, ‘\(t\)’ over intervals of time, \(P\) over functions of type \(<s\times\text{function}\), ‘\(R\)’ over functions of type \(<s\times i\times\text{function}\), ‘\(Q\)’ over functions of type \(<s\times t\times\text{function}\), and ‘\(T\)’ over functions of type \(<e\times\text{function}\). \textsuperscript{11} The implicit presence of the verb’s external arguments in verbal passives might be linked to the auxiliary used in verbal passives. The assumption that the verb’s external argument isn’t realized or absorbed by the participle morphology is also supported by the fact that the same morphology—with all the same allomorphs—is used in active perfect constructions.
Assuming that Function Composition is freely available for combining the denotations of $X^0$ categories, the stativizer in (14) can combine with a mere stem as well:

(15) **Building a stative (first way, lexical case)**

Stem: $\lambda x \lambda s \lambda e \{\text{pump}(e) \& \text{event}(e) \& \text{inflated}(x)(s) \& \text{cause}(s)(e)\}$
Stativizer: $\lambda R \lambda s \exists e R(s)(e)$
Output: $\lambda x (\lambda R \lambda s \exists e R(s)(e) (\lambda s \lambda e \{\text{pump}(e) \& \text{event}(e) \& \text{inflated}(x)(s) \& \text{cause}(s)(e)\} ))$

$= \lambda x \lambda s \exists e [\text{pump}(e) \& \text{event}(e) \& \text{inflated}(x)(s) \& \text{cause}(s)(e)]$

Previous analyses have argued or assumed that adjectival participles are lexical, in the sense that they are derived by an adjectivization operation that affects lexical items, rather than phrases\(^{12}\). We have already seen data that establish that resultant state passives in German can be phrasal. In (8a) above, for example, a VP-idiom is adjectivized. In (8b), adjectivization has affected a syntactically complex resultative construction. The following example shows that target state participles can be phrasal, too:

(16) a. Die Haare waren immer noch schlampig gekämmt.
The hairs were still sloppily combed
The hair was still combed sloppily.

b. *Die Haare waren schlampig fettig.
The hairs were sloppily greasy
‘The hair was greasy sloppily’

The manner adverb *schlampig* (‘sloppily’) cannot modify statives, as shown by the ungrammaticality of (16b). Since (16a) is grammatical, we have to conclude that the manner adverb can modify the stem *kämmt-* before the construction is stativized. In other words, the grammaticality of (16a) shows that the stativization operation that created the target state participle in (16a) must have affected a phrase, rather than a mere lexical item.

An immediate consequence of the proposed way of deriving target state participles seems to be that target state passives should have event implications: If the boat is now pumped up, for example, there has to be a pumping event that caused its state of being inflated. Browsing through lists of adjectives that look like participles, we find quite a number without event implications, however. Those adjectives are sometimes said to be ‘true’ adjectives, as opposed to participles, the implication being that there is something unpredictable about them. While there are a number of apparent ‘deverbal’ adjectives that are not derived in a completely compositional way, there are many others that look like participles, are compositionally related to the corresponding verbs, yet lack the expected event implications. Take (17):

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\(^{12}\) Wasow (1977), Bresnan (1982), Levin & Rappaport (1986), and many others.
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(17) The blood vessel was obstructed.

A blood vessel may be obstructed due to a malformation without there ever having been an event of obstruction. The vessel might just have grown that way. There might have been tissue that caused the obstruction. What is special about the verb *obstruct* is that it has stative, as well as eventive uses. Its stative use is illustrated in (18):

(18) Because of a congenital malformation, tissue obstructed the blood vessel.

Since the verb *obstruct* has stative and eventive uses, its Davidsonian argument has to be able to range over events (proper) as well as states. When the Davidsonian argument denotes an event, we are talking about a causal relation between that event and a state of obstruction. When it denotes a state, the causal relation is between two states, one of which might be the tissue’s being where it is, for example. Verbs like *obstruct*, then, are not essentially different from fully eventive verbs like *pump up*. They, too, have a target state argument in addition to a Davidsonian argument. The only difference is that their Davidsonian argument can have states in its range. The same stativizer can existentially quantify the Davidsonian argument, thereby creating an adjective. Examples of other verbs with stative and eventive uses are *surround, cover, support, illuminate*, and experiencer verbs like *depress* or *worry*. As expected under the proposed analysis, those verbs have target state passives without event implications.

If target state participles are built using the stativizer introduced in (14), it follows that only those verbs can have target state passives that characterize states as part of their meaning. Surprisingly, not all verbs that characterize states as part of their meanings have target state passives. The most puzzling exceptions are causative verbs like *empty* or *dry*, which lack target state passives, as illustrated in (2c) and (2d) above. Looking at a database of about 1,500 German verbs, an interesting generalization emerges. The generalization is illustrated in (19):

   The door is still closed+made

   b. Die Tür ist immer noch geschlossen.
   The door is still closed

*Zumachen* and *schliessen* are synonymous. The crucial difference between the two verbs is that *zumachen* is compositionally derived from *zu* (‘closed’, ‘shut’) and the light verb *machen* (‘make’), while *schliessen* (‘close’), is not a compositional causative. All causatives derived with the help of *machen* behave like *zumachen* in that they never permit target state passives. This suggests that the stems of causatives like English *dry* or *empty* might be derived by incorporation of the corresponding adjective into an unpronounced light verb stem, which would have to be the head of the resulting compound. Suppose now that light verb stems are specified for syntactic category, that is, they are V’s from the very start. Assume furthermore that only category neutral stems can have both
a target state and a Davidsonian event argument. When the head of a stem is a V, that stem is itself a V, hence is not category-neutral. Causatives like *empty or *dry, then, cannot have target state passives since at no stage in their derivation is there a category-neutral stem involved.

If the derivation of target state participles I proposed is on the right track, we should find target state participles for unaccusatives as well. Within the current framework of assumptions, transitive and unaccusative stems have the same argument structure. Neither transitive nor unaccusative stems have external arguments. The stativizing operations I proposed above wouldn’t be able to tell the difference, as long as there is a target state argument. As expected, there are target state ‘passives’ for unaccusative verbs:

(20) a. Der Arm ist immer noch geschwollen.  
The arm is still swollen.

b. Der See ist immer noch zugefrozen.  
The lake is still frozen over.

On the current analysis, target state participles have state arguments, just like other adjectives. It is therefore not surprising that they behave like underived adjectives with respect to gradability and degree modifiers (see Kennedy and McNally 1999). Moreover, we can account for the scale structure of target state participles without having to say anything special about their relationship to the ‘event structure’ of the corresponding verbs. The scale structure of a target state participle is expected to be the same as the scale structure of the target state property characterized by the corresponding verb, since the verb and the participle have the same ancestry. They are derived from the same category-neutral stem.

If target state passives can be the result of stativizing a whole phrase, it should be possible that the target state property is not provided by the verb, but by other material within the VP, a manner adverb, for example. The following contrast demonstrates that target state properties can indeed be contributed by adverbs:

My hairs were still cut
   ‘My hair was still cut’.

b. Meine Haare waren immer noch schlampig geschnitten.  
   My hairs were still sloppily cut
   My hair was still cut sloppily.

How come manner adverbs can provide target state arguments? The answer I want to consider is that adverbs, too, can describe target states and have target state arguments. They can express relations between states. This becomes clear once we think about the meaning of *sloppily, for example. For (21b) to be true, some sloppy hair-cutting action must have caused the current state of my hair. Moreover, it seems that the state in question has to carry information about what caused it, that is, it has to indicate that it came into existence through sloppy
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action. (21b) wouldn’t be true, for example, if my hairdresser was working very sloppily when cutting my hair, yet against all odds, the result of his sloppy working style bore all the usual signs of careful action. The adverb *sloppily*, then, can have a target state interpretation of the kind given in (22a). Combining (22a) with the denotation of *cut my hair* yields (22b). Existential quantification of the Davidsonian argument by one of the stativizers produces the stative predicate (22c):

(22) a. \( \lambda e \Lambda s [\text{action}(e) \& \text{cause}(s)(e) \& \text{indicate}(\text{sloppy}(e))(s)] \)

b. \( \lambda e \Lambda s [\text{action}(e) \& \text{cause}(s)(e) \& \text{cut}(\text{my hair})(e) \& \text{indicate}(\text{sloppy}(e))(s)] \)

c. \( \lambda s \exists e [\text{action}(e) \& \text{cause}(s)(e) \& \text{cut}(\text{my hair})(e) \& \text{indicate}(\text{sloppy}(e))(s)] \)

To summarize the discussion of target state participles, I have proposed that target state participles are derived by operators that retrieve target state properties from the constituents they operate on. Those target state properties are accessed through a state argument that is present at the relevant level of representation.

Resultant state participles are more widely available than target state participles. In fact, when a verb has a target state passive, it usually has a resultant state passive as well, as long as a ‘job done’ or ‘that’s over’ reading is plausible. Take (23) as an illustration:

(23) Das Gebäude ist geräumt.
The building is evacuated.

As a target state passive, (23) implies that there are currently no tenants in the building. When understood as a resultant state passive, (23) does not have that implication. (23) could be uttered truthfully by a police officer who is reporting the successful evacuation of the building to his supervisor at a time when tenants have moved back in again. What the officer reports is merely that the job assigned to him is done.

The only kinds of verbs that are plain ungrammatical in resultant state passives (or state passives of any kind) are verbs like *wissen* (‘know’) or *besitzen* (‘own’). I argued in Kratzer (1995) that those verbs do not have a Davidsonian event argument. The stativizer in a resultant state participle, then, seems to select predicates with an (unsaturated) Davidsonian argument. We have already seen that resultant state passives have perfect aspect, and this means that the derivation of a resultant state participle involves an aspectual operator:

(24) **Building a stative (second way, phrasal case)**

\[ \text{Stem} + \text{object: } \lambda e [\text{prove}(\text{the theorem})(e)] \]

\[ \text{Stativizer: } \lambda P \lambda e [P(e) \& \tau(e) \leq t] \]

\[ \text{Output: } \lambda \exists e [\text{prove}(\text{the theorem})(e) \& \tau(e) \leq t] \]

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13 The expression ‘sloppy(e)’ is of type \( t \), hence expresses a proposition, that is, a set of possible worlds. For discussion of the indication relation, see Stalnaker (1984).

14 Here, too, the lexical case is accounted for by Function Composition.
The stativizer in (24) maps properties of eventualities into properties of times, the usual job of an aspectual operator. In the example given, the output of stativization is a property of times that is true of any time that is preceded by the running time t(e) of an event e that is a completed event of proving the theorem. Whenever a time has that property, any later time is bound to have that property as well. This accounts for the observation that whenever a resultant state passive is true at a time, it is true forever after. It could not be otherwise.

Since resultant state participles can also be formed from stems with a target state argument, we have to think about what happens with that argument in those cases. The aspectual stativizer in (24) operates over properties of eventualities. But if Function Composition is available (at least at the X^6 level), the stativizer could also operate directly over stems that have both a target state and a Davidsonian argument. However, we would then end up with a dangling state argument that we would not be able to get rid off, barring 'spontaneous' existential quantification or higher operators that might seek out a target state argument. It seems, then, that something should force existential quantification of target state arguments before aspectual operators come into play. A natural candidate is the syntactic category label ‘V’. One possible denotation for ‘V’ could be an operator that existentially quantifies the target state argument—if there is one. The result would be a verbal passive participle that aspectual operators can work on. Assuming that aspectual operators must attach to Vs, existential quantification of target state arguments is forced.

The proposal that resultant state participles express properties of times (rather than properties of states), hence involve an aspectual operator, derives an important generalization about the possibility of un-prefixation:

(25) Any lexical (that is, non-phrasal) resultant state participle permits compositional un-prefixation. (Compositional un- expresses contradictory negation of the appropriate type.)

Here is a sketch of an explanation for (25). Phrasal state passives do not ever permit un-prefixation, a fact that can be accounted for by assuming that un- has to be attached in the lexicon, not in the syntax:

(26) a. * Ihm sind die Leviten ungelesen. Him(dat.) are the Leviticus (nom.plur.) unread 'He was unsolded.'

b. * Die Teekanne ist unleergetrunken. The teapot is un-empty-drunken 'The teapot is undrunk empty.'

15 The same question arises when für-PPs are contained in projections that become verbal at some later point in the derivation. Here, too, 'becoming verbal' seems to be linked to the binding of the target state argument.
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With underived adjectives and target state participles, \textit{un-}prefixation is unpredictable. Often, it is not acceptable at all (e.g. (27)), and if acceptable, it seems to express contrary, rather than contradictory negation (e.g. in (28)):

(27) \begin{align*}
& \text{leer} \quad \text{empty} \\
& \quad \quad \text{* unleer} \quad \text{unempty}
\end{align*}

(28) a. \begin{align*}
& \text{gesund} \quad \text{healthy} \\
& \quad \quad \text{ungesund} \quad \text{unhealthy}
\end{align*}

b. \begin{align*}
& \text{bekümmert} \quad \text{distressed} \\
& \quad \quad \text{unbekümmert} \quad \text{lighthearted}
\end{align*}

Underived adjectives and target state participles express relations between individuals and states, that is, they have denotations of type \textit{<<sst>>}. Here is what would happen if compositional \textit{un-} were to operate on such denotations:

(29) \begin{align*}
& \text{empty (adjective)} \\
& \quad \text{un-} \\
& \quad \quad \text{‘unempty’} \\
& \quad \quad \text{‘the mailbox (be) unempty’} \\
& \quad \quad \lambda x \lambda s [\text{empty}(x)(s)] \\
& \quad \quad \lambda Q \lambda x \lambda s [\neg Q(x)(s)] \\
& \quad \quad \lambda x \lambda s [\neg \text{empty}(x)(s)] \quad \text{No!} \\
& \quad \quad \lambda s [\neg \text{empty}(\text{the mailbox})(s)] \quad \text{No!}
\end{align*}

If compositional \textit{un-} could operate on adjectives that express relations between individuals and states, there would be sentences like \textit{the mailbox is unempty} that would be true (in a world) just in case there is a state that is not a state of the mailbox’s being empty. These truth-conditions are utterly trivial, however. Just about any state is a state that is not a state of the mailbox’s being empty. This is the reason, I suggest, why with underived or target state adjectives, \textit{un-} is either ungrammatical or not compositional. With compositional \textit{un-}, the output would be semantically anomalous. Now look what happens when \textit{un-} appears as prefix of a (lexical) resultant state participle:

(30) \begin{align*}
& \text{empty (verb)} \\
& \quad \text{emptied} \\
& \quad \text{un-} \\
& \quad \quad \text{‘unemptied’} \\
& \quad \quad \text{‘the mailbox (be) unemptied’} \\
& \quad \quad \lambda x \lambda \exists s [\text{empty}(x)(s) \& \text{cause}(s)(e)] \\
& \quad \quad \lambda x \lambda t \exists e \exists s [\text{empty}(x)(s) \& \text{cause}(s)(e) \& \tau(e) \leq t] \\
& \quad \quad \lambda T \lambda x \lambda t [\neg T(x)(t)] \\
& \quad \quad \lambda x \lambda t \neg \exists e \exists s [\text{empty}(x)(s) \& \text{cause}(s)(e) \& \tau(e) \leq t] \\
& \quad \quad \lambda t \neg \exists e \exists s [\text{empty}(\text{the mailbox})(s) \& \text{cause}(s)(e) \& \tau(e) \leq t]
\end{align*}

According to (30), the sentence \textit{the mailbox is unemptied} is true (in a world) at a time \( t \), just in case \( t \) is not preceded by an event of emptying the mailbox. Allowing for pragmatic determination of the time span we are looking at, these truth-conditions are right. The important point is that if the participles in resultant state passives denote properties of times, rather than properties of states, compositional \textit{un-}prefixation yields a semantically acceptable result. I suspect that this is why \textit{un-}prefixation is predictable for resultant state participles.
Resultant state participles are expected to be less adjective-like than target state participles under the current analysis. This seems to be so, given that resultant state participles are never gradable, for example, and they never permit the degree modifier *very*.

The analysis of target state and resultant state passives I explored in this short paper led me to posit three different types of passive participles in German that are all pronounced the same:

(31)  
\begin{align*}
\text{a.} & \quad [\text{ge-...-en}]_A & \text{Adjectival} \\
\text{b.} & \quad [\text{ge-...-en}]_V & \text{Verbal} \\
\text{c.} & \quad [ \text{[ge-...-en]_V Perfect Aspects} ] & \text{Perfect Aspect}
\end{align*}

As the reader might have guessed, the next step to take will be to find out whether the verbal participles of (31b) are also used in verbal passives with the auxiliary *werden*, and whether the perfect participles of (31c) are also used in active perfect constructions with the auxiliary *haben* (‘have’). Execution of this project will have to be left for another occasion. There are too many bumps in the road and too many miles still to go.

References


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Alternatives for Aspectual Particles: Semantics of still and already

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1. Semantic Relations between Aspectual Particles
Aspectual particles (the term is due to König (1991)) appear to come in groups, related by negation, and therefore have attracted the attention of formal semanticists. The following examples list the particles of English, German and Hebrew; they show that the system is semantically transparent in various degrees.

(1) a. *It is already raining.* b. *It is not yet raining.* c. *It is not raining anymore.*
    d. *Es regnet schon.*
    (2) a. *Es regnet noch.* b. *Es regnet noch nicht.* ('still not')
    d. *Es regnet nicht mehr.* ('not (any)more')
(3) a. *kvar yored geshem.* b. *'adayin lo yored geshem.* ('still not')
    d. *kvar lo yored geshem.* ('already not')

According to (Löbner 1989), who worked on German, the particles form a system similar to that of quantifiers that are related by internal and external negation:

```
already/schon/kvar  OUTTER NEGATION  not yet/noch nicht/'adayin lo
    INNER NEGATION  DUALS  still/noch/'adayin
not anymore/nicht mehr/kvar lo
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The claim that aspectual particles are thus related is attractive if we consider German, and particularly Hebrew (which is quite similar to Spanish, cf. toda una no ‘still not’ and ya no ‘already not’, and Slavic, cf. Czech jeste ne ‘still not’ and uz ne ‘already not’). These forms wear the internal negations on their sleeves. English relates terms by their outer negation, but less clearly so, as the original particles occur in suppletive forms (already as yet, and still as anymore). These are negative polarity items; the alternations are quite similar to alternations like some / any. We find yet in the meaning of ‘already’ also in questions, a known context for negative polarity items, as in Has the attack been launched yet? German shows an interesting piece of evidence for duality, as noch nicht ‘still not’ is sometimes analyzed as ‘not already’, with negation taking wide scope over a modal element (Angelika Kratzer, pers. comm.) The sentence es kann noch nicht regnen, lit. ‘it can still not rain’, has as its preferred reading ‘It is not possible that it is already raining’.
2. Aspectual Particles as Phase Quantifiers
Let us assume that sentences $\Phi$ are true or false of time intervals $t$; that is, $\Phi(t)$ is true iff $\Phi$ is true throughout the interval $t$. I will write $t' \approx t$ to express that the interval $t'$ has begun before $t$ and abuts $t$. Löbner proposes the meanings in (5), which relate propositions to intervals ("phases"):

\[(5)\]

a. **ALREADY**($t$, $\Phi$):
   - **assert:** $\Phi$ holds at $t$
   - **pres.:** $\neg \Phi$ was true before $t$
   \[\exists t'<t[\neg \Phi(t')]\]

b. **STILL**($t$, $\Phi$):
   - **assert:** $\Phi$ holds at $t$
   - **pres.:** $\Phi$ was true before $t$
   \[\exists t'[t[\Phi(t')]\]

c. **NOTYET**($t$, $\Phi$):
   - **assert:** $\Phi$ does not hold at $t$
   - **pres.:** $\neg \Phi$ was true before $t$
   \[\exists t'[\neg \Phi(t')]\]

d. **NOTANYMORE**($t$, $\Phi$):
   - **assert:** $\Phi$ does not hold at $t$
   - **pres.:** $\Phi$ was true before $t$
   \[\exists t'[\Phi(t')]\]

This analysis is supposed to capture the logical relationships between the particles observed in (4). Outer negation negates the assertion part but not the presupposition, as expected. The relationship dubbed "inner negation" is peculiar, however: it is a negation within the presuppositional component. This is quite different from inner negation of quantifiers, seen as second-order predicates: the outer negation of $Q(P)$ is $\neg (Q(P))$, and its inner negation is $Q(\neg P)$. The latter is quite different from the negation in the presuppositional component we find in (5). True, Löbner defines a quantifier that he writes "$\exists \forall$" that appears to behave in the expected way, but this quantifier is a rather artificial creature.

Löbner distinguishes the aspectual particles discussed above (Type-1) from another use, called **Type-2**, in which they associate with a focus in the sentence (from now on I will mostly give German examples; focus will be marked by F).

\[(6)\]  
Lydia ist schon dréi Monate alt. ‘Lydia is already three months old’

One reason to distinguish between the two types is that Type-1 still/noch is replaced by only/erst in Type-2. Also, the outer negation of only/erst is not not anymore/nicht mehr, but the more transparent not only / nicht erst.

\[(7)\]

a. Lydia is only three months old.
   b. Lydia ist erst drei Monaten alt.

\[(8)\]

a. Lydia is not only three months old.
   b. Lydia ist nicht erst drei Monate alt.

**Type-3** aspeclual particles focus on a time adverbial:

\[(9)\]  
Lydia ist schon um dréi Uhr angekommen  
Lydia AUX already at three o’clock arrived  
‘It was already three o’clock when Lydia arrived.’

We distinguish Type-3 from Type-2, as (10.a) implicates that Lydia is older than expected, whereas (b) implicates that Lydia arrived earlier than expected (cf. also König (1977)):

\[(10)\]

a. Lydia ist schon dréi Monate alt (*nicht erst zwei / nicht vier)
   b. Lydia ist schon um dréi Uhr angekommen (nicht erst um zwei / *vier)
Alternatives for Aspectual Particles

I will cast Löbner’s theory in a general theory of association with focus, assuming that focus introduces a partition into a background part and a focus part (cf. von Stechow (1990), which I will write as a pair \( (B, F) \). According to Löbner, Type-2 particles are related to Type-1 particles, as follows:

\[
\begin{align*}
\text{(11)} & \quad \text{ALREADY}_{T_2}(t, (B, F)) \\
& \quad \leftrightarrow \text{ALREADY}(t, B(F)) \quad (\leftrightarrow B(F)(t), \text{pres: } \exists t \prec t_1[B(F)(t)])
\end{align*}
\]

\[
\begin{align*}
\text{(12)} & \quad \text{Lydia ist schon dréi Monate alt.} \\
& \quad \text{ALREADY}_{T_2}(t, \langle \lambda n \lambda t[MOLLES(L)(t) = n], 3 \rangle) \\
& \quad \leftrightarrow \text{ALREADY}(t, \lambda t[MOLLES(L)(t) = 3]) \\
& \quad \leftrightarrow \text{MONTHS(L)(t)} = 3, \text{pres: } \exists t \prec t_1[\neg \text{MONTHS(L)(t)} = (3)]
\end{align*}
\]

‘Lydia is three months old’, pres.: ‘Lydia was not three months old before.’

This meaning rule does not make use of the background/focus partition. But there is a requirement for the background: It must denote a particular kind of relation between the alternatives to the focus values and times, namely one that is monotonic:

\[
\begin{align*}
\text{(13)} & \quad \forall n \forall n' \forall t \forall t' [n < n' \wedge B(n)(t) \wedge B(n')\langle t' \rightarrow t < t']
\end{align*}
\]

The background of (12) satisfies this condition: If \( n < n' \), then the time at which Lydia is \( n \) months old precedes the time at which Lydia is \( n' \) months old.

I see two problems with that analysis. First, background-focus structures play a rather indirect role; the meaning of the particles does not refer directly to it. Second, we would prefer one common analysis for Type-1 and Type-2 particles.

Let us turn to Type-3 particles. Löbner assumes that their focus is on the expression that specifies the reference time itself. He proposes that Type-3 \textit{schon} is reduced to Type-1 \textit{noch}, following the paraphrase of 
\textit{Lydia ist schon géstern} \textit{angekommen} as ‘When Lydia had arrived it was still (noch) yesterday’. That is, \text{ALREADY}_{T_3} is reduced to the \text{STILL}-relation between the time at which the background is true, \( t[B(t)] \), and a predicate that identifies the times to which the focus applies, \( \lambda t[t \subseteq F] \).

\[
\begin{align*}
\text{(14)} & \quad \text{ALREADY}_{T_3}(B, F)) \\
& \quad \leftrightarrow \text{STILL}(tt[B(t)], \lambda t[t \subseteq F]) \\
& \quad \leftrightarrow t[B(t)] \subseteq F, \text{pres: } \exists t' \prec tt[B(t)][t' \subseteq F]
\end{align*}
\]

\[
\begin{align*}
\text{(15)} & \quad \text{Lydia ist schon géstern} \textit{angekommen}. \\
& \quad \text{ALREADY}_{T_3}(\langle \lambda t[\text{ARRIVE}(L)(t)], \text{YESTERDAY} \rangle) \\
& \quad \leftrightarrow \text{STILL}(tt[\text{ARRIVE}(L)(t)], \lambda t[t \subseteq \text{YESTERDAY}]) \\
& \quad \leftrightarrow t[\text{ARRIVE}(L)(t)] \subseteq \text{YESTERDAY}, \text{pres: } \exists t' \prec tt[\text{ARRIVE}(L)(t)][t' \subseteq \text{YESTERDAY}]
\end{align*}
\]

‘Lydia’s arrival happened within yesterday’, presupposition: there is a time \( t \) immediately before Lydia’s arrival that is also within yesterday.

This analysis is problematic on several counts. First, the meaning of Type-3 \textit{schon} is reduced to its Type-1 dual, \textit{noch} (and Type-3 \textit{noch} is reduced to Type-1 \textit{schon}). Second, the truth conditions do not quite come out as expected: (15) excludes that Lydia’s arrival happened at the very beginning of yesterday, which certainly is not required by the English sentence. Third, we have a problem in case the time adverbial refers to a time point, as in the following case:
a. *Lydia ist schon um drüi Uhr angekommen.*

b. \( \text{ALREADY}_{\text{t}_{\text{drüi}}}((\lambda t[\text{ARRIVE}(L)(t)], 3\text{PM})) \)
\( \iff \text{ STILL}(\text{t}[\text{ARRIVE}(L)(t)], \lambda t[t \subseteq 3\text{PM}]) \)
\( \iff \text{t}[\text{ARRIVE}(L)(t)] \subseteq 3\text{PM}, \text{pres: } \exists t' \approx \text{t}[\text{ARRIVE}(L)(t)][t' \subseteq 3\text{PM}] \)

If 3PM is the time point at which Lydia arrived, then there cannot be a time before Lydia’s arrival that is also 3PM.

3. Aspectual Particles as Restrictors for Alternatives

I would like to propose an alternative to Löbner’s treatment that keeps the insights of his work but does not run into the various problems that we have encountered in its discussion. I will make the following assumptions. First, all uses of aspectual particles are focus-sensitive, including Type-1 uses. This leads to a more uniform description. Second, they express a restriction of the alternatives of the focus that are to be considered. In this they resemble focus-sensitive operators like *at least* and *at most* as described in Krifka (1999). Third, this restriction is based on an intrinsic ordering of the alternatives, which I will call \( \leq_{A} \). And finally, this ordering is aligned to the ordering of times or a related ordering, which is quite similar to Löbner’s assumption of the background of Type-2 uses, (13).

The basic idea is that *already* indicates that the valid alternatives are ranked lower than the focus, on the relevant ordering of alternatives, whereas *still* indicates that the alternatives are ranked higher:

(17) *Lydia ist schon drüi Monate alt* (uttered at \( t \).)

Propositions considered ("alternatives"): \{MONTHS(L)(t)=n | 1 \leq n \},
\( \text{i.e. MONTHS(L)(t)=1, MONTHS(L)(t)=2, MONTHS(L)(t)=3} \)
Proposition asserted: MONTHS(L)(t)=3

(18) *Lydia ist erst drüi Monate alt* (uttered at \( t \).)

Propositions considered: \{MONTHS(L)(t)=n | n \leq 3 \}
Propositions asserted: MONTHS(L)(t)=3

Let us make explicit the alternatives and their order in our notation for structured meanings, by writing them as \( \langle B, F, \leq_{A} \rangle \), where \( \leq_{A} \) is an ordering relation on the sets of alternatives A (cf. Krifka (1995) for a similar treatment of negative polarity items). The nature of the alternatives (lower/higher than the focus value) is not asserted, but presupposed. This leads to the following interpretations:

(19) a. \( \text{ALREADY}(\langle B, F, \leq_{A} \rangle) \iff \langle B, F, \leq_{A} \rangle, \text{pres: } \forall X \in A[X \leq_{A} F] \)
b. \( \text{STILL}(\langle B, F, \leq_{A} \rangle) \iff \langle B, F, \leq_{A} \rangle, \text{pres: } \forall X \in A[F \leq_{A} X] \)

In this view, aspectual particles do not actually make use of the background-focus structure – when they are applied to a background-focus structure we get a background-focus structure again. They just indicate a certain restriction for the set of alternatives to the focus: They must be ordered, and the focus must be a maximal or minimal element. The resulting background-focus structures then are interpreted in the usual way. In particular, if a background-focus structure \( \langle B, F, \leq_{A} \rangle \) is asserted, then this amounts to asserting \( B(F) \), where a set of possible assertions \( B(X) \), with \( X \in A \), are under consideration as alternatives to the assertion that is actually made. That is, these are assertions that, given the common ground and the informational interest of the interlocutors, could have been made at the current point of conversations. The fact that they have not been made often leads to pragmatic inferences, just
as with scalar implicatures. Consider the following example, where \( \leq_{1,2,3} \) stands for the relation \( \{(1, 1), (1, 2), (1, 3), (2, 2), (2, 3), (3, 3)\} \).

\[
(20) \quad \begin{align*}
  &a. \text{ Lydia ist schon drgli Monate alt (uttered at t).} \\
  &b. \text{ ALREADY}(\lambda n \lambda t[\text{MONTHS}(L)(t) = n], 3, \leq_{1,2,3})(t) \\
  &c. \text{ } (\lambda n \lambda t[\text{MONTHS}(L)(t) = n], 3, \leq_{1,2,3})(t), \\
  &\quad \text{the presupposition, } \forall n \in \{1, 2, 3\} \{n \leq_{1,2,3} 3\} \text{ is satisfied.} \\
  &c. \text{ Assertion: } \lambda n \lambda t[\text{MONTHS}(L)(t) = n](3)(t), \text{i.e. } \text{MONTHS}(L)(t) = 3; \\
  &\quad \text{alternative assertions: } \text{MONTHS}(L)(t) = 1, \text{MONTHS}(L)(t) = 2, \text{MONTHS}(L)(t) = 3
\end{align*}
\]

The speaker asserts that Lydia is three months old, and indicates that there are alternative propositions – that Lydia is one month old and that Lydia is two months old – that might have been asserted at this point but that are explicitly not asserted. The contribution of already is to restrict the alternative propositions.

It is perhaps helpful to represent this schematically, especially if we want to compare the effect of different aspectual operators (in the following, underlined numbers like 1 stand for propositions like ‘Lydia is 1 month old’)

\[
(21) \quad \begin{align*}
  &a. \text{ Lydia ist drgli Monate alt.} \\
  &\quad \text{alternatives considered: } 1 \quad 2 \quad 3 \quad 4 \quad 5 \\
  &\quad \text{alternative asserted: } 3 \\
  &b. \text{ Lydia ist schon drgli Monate alt.} \\
  &\quad \text{alternatives considered: } 1 \quad 2 \quad 3 \\
  &\quad \text{alternative asserted: } 3 \\
  &c. \text{ Lydia ist noch drgli Monate alt.} \\
  &\quad \text{alternatives considered: } 3 \quad 4 \quad 5 \\
  &\quad \text{alternative asserted: } 3 \\
\end{align*}
\]

Focus requires that there is at least one proper alternative to the expression asserted, i.e. the minimal system for (21b) is \{2, 3\}, and for (c) \{3, 4\}.

The semantics of aspectual particles in this view is rather schematic. But it leads to certain pragmatic effects that are perceived as their real contribution. By a general pragmatic rule, a consequence of the maxim of relevance, the alternative propositions must be considered reasonable, or entertainable, at the current point in discourse. The net effect of schon then is to indicate that Lydia’s age is the greatest of those that are considered entertainable. If we assume that the “expected” age is the average of the alternatives, then we can reconstruct one typical interpretation of sentences with schon and erst, namely that they express a deviation from expected values in a particular direction: Schon in (21a) gives rise to the understanding that Lydia’s age is greater than may have been expected, and erst in (21b), that it is smaller than may have been expected. These meaning components are conversational implicatures that arise from the fact that only such alternatives are constructed that can plausibly be entertained. That this meaning component is an implicature has also been proposed by Löbner (1989) and Michaelis (1996), in contrast to van der Auwera (1993), who considers it as part of the lexical meaning of these particles.

This removes a problem that van der Auwera (1993) sees with Löbner’s hypothesis that already and still are duals. From duality we have (22a); we also judge (b) true; this leads to the intuitively problematic conclusion (c).
(22)  a.  It isn’t the case that it still is not raining.  ⇒  It is raining already.
    b.  It is finally raining.  ⇒  It isn’t the case that it still is not raining.
    c.  (!)  It is finally raining  ⇒  It is raining already.

(22c) is odd because the first sentence indicates that it rained later than expected, and
the second that it rained earlier than expected. But these meanings are not part of
what is asserted; rather, they are presuppositions (in the case of finally) or implica-
tures (in the case of already). The pure propositional content of the two sentences in
(22c) is the same, and hence (22c) is, literally, true. (See Löbner (1999) for a more
detailed version of this argument).

Another pragmatic side-effect is that the common ground is often understood as
containing the information that at least one of the alternative propositions is true.
Why else should a speaker suggest a certain set of alternative propositions, if not to
indicate that he or she assumes that these are the propositions out of which one can
be asserted. Again, this is not a presupposition, but an implicature, due to general
laws of conversation.

A sentence like (21b) restricts the set of alternative propositions, by excluding
propositions like ‘Lydia is four months old’. This does not always mean that these
propositions are false. (23) is not a contradiction:

(23)  Lydia is already three, months old, perhaps she even is already four.

The second clause imposes a larger set of alternatives that includes the value ‘Hans
is 4 months old’, which, given the previous selection of alternatives, presumably was
considered so unlikely that it did not even show up as an alternative to be reasonably
considered. Of course, for (23) not to be a contradiction we must assume that being
n years old entails being m years old, if m ≤ n.

Let us now discuss the order between alternatives, ≤ₐ. We should not assume
right from the outset that this order is given. Context may play a decisive role:

(24)  John already weighs in on [80 kilograms].

If John is in a weight gain clinic, the admitted alternatives are smaller than 80, but if
he is in a weight loss clinic, the alternatives are greater than 80 kilograms (the sen-
tence John weighs in on 85 kilograms, he even already weighs in on 80 kilograms
is not a contradiction in this scenario). That is, we must assume, just as Löbner did,
that there is a monotonic mapping between alternatives and time:

(25)  let and ≤ₐ are aligned with respect to f: [T → A] iff
       ∀t,t’∈T∀X,X’∈A[f(t)=X ∧ f(t’)=X’ → [X ≤ₐ X’ → t ≤ₐ t’]]

This formulation allows for times to be denser than the alternatives:

(26)  T:   t₀  t₁  t₂  t₃  t₄  t₅  t₆  t₇  t₈  t₀  t₁₀  ordered times
    A:   a₀  a₁  a₂  ordered alternatives

The alternatives, of course, need not be numbers. For example, in You are always so
late to the opera! Otello already found the handkerchief, the alternatives are the pre-
vious events of the opera, ordered in the sequence in which they are canonically performed. It is also well-known that we find alignments with respect to other than temporal orders (cf. Löbner (1989), Michaelis (1993), Michaelis (1996)), as in *El Paso is still in Texas* (seen from a Texas perspective), or *The Honda is still a compact car* (when discussing smallish cars). This makes the term 'aspectual particle' dubious; we may speak of **scale alignment particles**.

We have to incorporate the requirement of scale alignment in the formal semantics of the particles, which clearly is a presupposition:

\[
\text{(27)} \quad \text{ALREADY}(\langle B, F, \leq_A \rangle) \iff \langle B, F, \leq_A \rangle, \\
\text{under the presuppositions that } \forall X \in A[X \leq_A F] \text{ and } \leq_A \text{ is aligned with time.}
\]

Let us now turn to Type-1 particles. They can be treated as focus-sensitive if we assume that the focus is over the whole sentence, leading to an empty background (Löbner (1999) also calls them sentence focus particles). Also, the alternative in this use is the negation of the proposition in question. Consider the following example, where \(\leq_{rr}^{\neg} \) stands for the relation \(\{\neg\text{RAIN}, \neg\text{RAIN}, \langle\neg\text{RAIN}, \text{RAIN}\rangle, \langle\text{RAIN}, \text{RAIN}\rangle\} \):

\[
\text{(28)} \quad [\text{Es régnet}]_F \text{schoen} \quad \text{ALREADY}(\langle \lambda p[p], \text{RAIN}, \leq_{\neg,rr} \rangle)
\]

'It is already raining'

The alignment presupposition requires that \(\neg\text{RAIN}\) is true before \text{RAIN} is true. We have the following configurations:

\[
\text{(29) a. } [\text{Es régnet}]_F \text{schoen}.
\quad \begin{array}{cc}
\text{alternatives considered:} & \neg\text{RAIN} \quad \text{RAIN} \\
\text{alternatives asserted:} & \text{RAIN} \quad \neg\text{RAIN}
\end{array}
\]

\[
\text{b. } [\text{Es régnet}]_F \text{noch}.
\quad \begin{array}{cc}
\text{alternatives considered:} & \text{RAIN} \quad \neg\text{RAIN} \\
\text{alternatives asserted:} & \text{RAIN} \quad \text{RAIN}
\end{array}
\]

Löbner argued for a distinction between Type-1 and Type-2 because of the distinction between German *noch* and *erst* (cf. (7)). But what determines this distinction is rather the number of alternatives. If there are just two alternatives, *noch* is used; otherwise, *erst*. We find cases with sentence focus with *erst* (cf. (30a)), and cases with subsentential focus that employ *noch* (cf. (30b)):

\[
\text{(30) a. } [\text{Es regnet}]_F \text{erst}. \text{‘It is still / only raining’ (o.k. if talking about a cold front that is expected to bring first rain, then hail, then snow).}
\]

\[
\text{b. } \text{Der Frosch ist noch / *erst lebendig}_F. \text{‘The frog is still alive’}
\quad \text{(two alternatives: ‘be alive’, ‘be dead’).}
\]

There is a certain problem of Löbner's analysis does not appear in our formulation. According to Löbner, *already* applied to \(\Phi\) presupposes a phase before the reference time for which \(\neg\Phi\) holds (cf. (5.b)). Mittwoch (1993) pointed out that this is not plausible for examples like the following:

\[
\text{(31) a. } \text{I've applied for American citizenship.}
\quad \text{B: } \text{Is your husband also applying?}
\quad \text{A: } \text{He is already American, for he was born in America.}
\]

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The current analysis does not have this problem: it just asks to consider the propositions 'he is not American', 'he is American', in that temporal order. It does not require that the proposition 'he is not American' is actually true at any time in the actual world. In order to implement this solution, we would have to make the dependence of propositions to possible worlds explicit, which I will not do here for reasons of space.

4. Semantic Relations, Again

Let us now turn to the semantic relations that we have observed between the particles, and check whether they can be explained by the semantic analysis of already and still developed above. We have to check whether the meanings of already and still stand in the relation of outer negation and inner negation to the meanings of not yet and not anymore, respectively, and whether they stand in the relation of duality to each other. Let us first consider inner negation:

\[(32) \quad \text{a. } \text{ALREADY}(\neg (B, F, \leq_A)) \quad \text{b. } \text{STILL}(\neg (B, F, \leq_A))\]

The bare truth conditions of a background-focus structure consist of the background applied to the focus B(F), hence its negation is \(\neg [B(F)]\). To achieve this, negation is lifted to the type of the background; we have \(\neg [B(F)] = \neg [B(F(t))]\). The negation of \((B, F)\) then is \((\neg B, F, \leq_A)\), and (32a,b) is equivalent to (33a,b):

\[(33) \quad \text{a. } \text{ALREADY}(\langle \neg B, F, \leq_A \rangle) \quad \text{b. } \text{STILL}(\langle \neg B, F, \leq_A \rangle)\]

Let us now see what (33a) amounts to when it is asserted:

\[(34) \quad \text{ALREADY}(\langle \neg B, F, \leq_A \rangle), \text{ pres: } \forall X \in A[X \leq_A F], \leq_A \text{ aligned with time}\]

Assertion: \(\neg [B(F(t))]\), i.e. \(\neg [B(F(t))]\)

Alternatives: \(\{\neg [B(X(t))] \mid X \leq_A F\}, \leq_A \text{ aligned with time}\)

In case there are only two alternatives, we get the following result:

\[(35) \quad [\text{Es régnet}]_R \text{ nicht mehr} .\]

('not anymore', analyzed as 'already not' uttered at time t):

ALREADY(\(\langle \lambda p[p], \text{RAIN}, \leq_{R,R} \rangle \rangle(t),\))

Assertion: \(\neg \lambda p[p](\text{RAIN})(t)) = \langle \lambda p[p](\text{RAIN})(t)\rangle = \neg \text{RAIN}(t)\)

Alternatives: \(\{\neg p(t) \mid p \leq_{R,R} \text{RAIN}\}, \leq_{R,R} \text{aligned with time, i.e. } \{\neg \text{RAIN(t)}, \neg \text{RAIN(t)}\} = \{\text{RAIN(t)}, \neg \text{RAIN(t)}\}\)

The order of the two alternative assertions is the one that we expect for this example: it assumes a period of rain followed by no rain. Using the format employed above, 'already not' and 'still not' turn out as follows (where \(\neg \text{RAIN} = \text{RAIN}\):

\[(36) \quad \text{a. } [\text{Es régnet}]_R \text{ nicht mehr}. \text{('not anymore', analyzed as 'already not')}\]

alternatives considered: \(\neg \text{RAIN} \quad \neg \text{RAIN}\)

alternatives proposed: \(\neg \text{RAIN} \quad \neg \text{RAIN}\)

\[\text{b. } [\text{Es régnet}]_R \text{ noch nicht} . \text{('still not')}\]

alternatives considered: \(\neg \text{RAIN} \quad \neg \text{RAIN}\)

alternatives proposed: \(\neg \text{RAIN} \quad \neg \text{RAIN}\)
Alternatives for Aspectual Particles

Let us now turn to the internal negation of Type-2 particles that do not focus on a sentence. I give hypothetical examples that illustrate the suggested analysis below.

(37) ‘Lydia is already not three months old’ (not anymore)

already \((\lnot \forall n \lnot \forall t (\text{MONTHS}(t) = n, 3, \leq 1, 2, 3))\), uttered at time t:

Assertion: \([-\text{MONTHS}(L) = 3]\)

Alternatives: \([-\text{MONTHS}(L) = 1], -\text{MONTHS}(L) = 2], -\text{MONTHS}(L) = 3]\)

(38) a. ‘Lydia is already not three months old’ (not anymore)

alternatives considered:

\([-1 -2 -3]\)

alternatives asserted:

\([-3]\)

b. ‘Lydia is still not three months old’ (not yet)

alternatives considered:

\([-3 -4 -5]\)

alternatives asserted:

\([-3]\)

These representations are problematic. (38a) should entail that Lydia is more than three months old, but our analysis allows that she is, say, 2 months old. And (38b) should entail that she is less than three months old, but our analysis allows that she is, say, 4 months old. We could perhaps fix this by assuming that, when someone is n months old, then this person is also m months old, if m \(\leq n\) (cf. Lydia is 21, she is even 23 years old). But this doesn’t seem to help for (38a).

Recall that inner negation behaved as predicted in Type-1 cases, where a proposition and its negation form the set of alternatives. If we analyze the examples above as involving the predicate ‘be three years old’ and its negation, then we get the right result. There is indeed evidence that particles with overt inner negation do not focus on small constituents like number words. The German example (39a) is infelicitous, in contrast to (b), where accent suggests predicate focus, with the negation of the predicate as the plausible alternative.

(39) a. ‘Lydia ist noch nicht drei Jahre alt. ‘Lydia is still not three years old’

b. Lydia ist noch nicht / noch keine drei Jahre alt.

alternatives considered:

\([-3 -3]\)

alternative asserted:

\([-3]\)

We now turn to outer negation, which should relate already to not yet, and still to not anymore. It is plausible to assume that outer negation is the negation of the communicative effect that a sentence with a particle would have. To negate the effect of Lydia is already three months old, we have to negate what that sentence would have said – that Lydia is three months old, with the implicature that propositions ‘Lydia is n months old’ for n = 1, 2, 3 were being considered. The negation affects the content, but not the implicature. This is as with other cases of implicatures; for example, Lydia has three rattles has the implicature that Lydia doesn’t have four rattles, but this implicature is not negated by Lydia doesn’t have three rattles. With this in mind, outer negation has the following effect:

(40) a. ‘It is not already raining’ (not yet)

alternatives considered (cf. (29a)):

alternative asserted:

\([-\text{RAIN} \text{RAIN} ]\)

b. ‘It is not still raining’ (not anymore)

alternatives considered (cf. (29b)):

alternative asserted:

\([\text{RAIN} \text{RAIN} ]\)
(41) a. ‘Lydia is not already three months old’ (not yet)
    alternatives considered (cf. (21b)):
    alternative asserted:
        1 2 3
        −3

b. ‘Lydia is not still three months old’ (not anymore)
    alternatives considered (cf. (21c)):
    alternative asserted:
        3 4 5
        −3

Things look better in this case than with inner negation. If we assume that one of the
alternative propositions is true, then (41a) entails that Lydia is 2 or 1 months old (by
scalar implicature, that she is 2 months old). And (41b) entails that Lydia is 4 or
more months old.

We have seen that the semantic relations postulated by Löbner could be recon-
structed within the current theory of aspectual particles, but only for Type-1 uses.
We found that inner negation does not relate the particles in their Type-2 use, but
then the inner negations of already and still may not have this use to begin with.

5. Speed of Developments

Recall from (10) that focus on time adverbials (Type-3) has the peculiar effect of
switching the earliness/lateness implicatures of aspectual particles, an effect that
forced Löbner to analyze Type-3 schon and noch as related to Type-1 noch and
schon, respectively. But Löbner also observed that both (10a) and (b) indicate a de-
velopment that is faster than expected, that is, faster than alternative developments:
In (10a), the time progressed faster than expected; it is now at a point such that
MONTHS(L) = 3, having passed smaller values. In (10b), the arrival of Lydia oc-
curred earlier than expected, namely at the time 3 o’clock, and not at 4 o’clock, 5
o’clock, or later.

Developments are mappings between events or states, and times. There are two
options: either time is the independent variable and the events are the dependent var-
iable; this is the Type-2 use, where a particular reference time is related to alternative
events that form stages of a sequence. Or the events are the independent variable and
the time is the dependent variable; this is the Type-3 use, which relates a particular
event to alternative reference times. We can depict this as follows, where the inde-
dependent variable is on the horizontal axis:

(42) age faster slower time slower faster

\[
\text{Lydia ist schon dréi Monate alt.}
\]
\[
\text{Lydia ist schon um dréi Uhr gekommen.}
\]

The faster development leads to the higher focus values in the Type-2 case, and to
the lower values in the Type-3 case.
Alternatives for AspectualParticles

The alternatives that are to be considered for already are those that would indicate a slower development, and it is asserted that the fastest development, among the developments under consideration, happened. We have to compare the speed of developments across possible worlds: in (10a), we compare the age of Lydia in the real world with the age of Lydia in other possible worlds in which things concerning Lydia’s age would have developed more slowly. In (10b), we compare the time of Lydia’s arrival in the real world with the time of Lydia’s arrival in other possible worlds in which things concerning Lydia’s arrival would have developed more slowly. The following representation makes this reference to possible worlds explicit: in (43a), the background is a function from possible worlds i to a relation between numbers n and times t, where n is the age of Lydia at time t in i. In (43b), it is a function from possible worlds i to a relation between times t and events e, where t is the time at which e happens in i.

\[(43)\]
\[a. \ \text{Lydia ist schon dréi}_i \text{ Monate alt.} \ \text{Backgr: } \lambda i \lambda n \lambda t [\text{MONTHS}(i)(L)(t) = n] \]
\[b. \ \text{Lydia ist schon um dréi}_i \text{ Uhr gekommen} \ \text{Backgr: } \lambda i \lambda t \lambda e [\text{TIME}(i)(e) = t] \]

Backgrounds specify developments that can be compared as to their speed: a background B develops at most as fast in a possible world i as in a possible world i', B(i) ≤ B(i'), if B(i) takes the same or a greater amount of time than B(i') to achieve the same results, that is, to reach the same non-temporal parameter value. As the time can be the first or the second argument of B(i), we need a way to refer uniformly to the time argument of a background; I will write B(i)[t,x] for B(i)(t)(x) or B(i)(x)(t), depending on the position of the time argument. Now we can define what it means that a background B develops at most as fast in i as in i', B(i) ≤ B(i') (cf. (44)), and the examples in (45a,b), where we have B(i) ≤ B(i')):

\[(44)\]
\[B(i) \leq B(i') \iff \forall x \forall t \forall t'[B(i)[t,x] \land B(i')[t',x] \rightarrow t' \leq t] \]

\[(45)\]
\[a. \ \text{B(i)} = \{ (t_1, 1), (t_2, 1), (t_3, 2), (t_4, 2), \ldots \}, \]
\[B(i') = \{ (t_1, 1), (t_2, 2), (t_3, 3), (t_4, 4), \ldots \} \]
\[b. \ \text{B(i)} = \{ (c_{i_1}, t_1), (c_{i_2}, t_1), (c_{i_3}, t_2), \ldots \}, \]
\[B(i') = \{ (c_{i_4}, t_2), (c_{i_5}, t_3), (c_{i_6}, t_4), \ldots \} \]

We integrate this notion of development speed into the semantics of aspectual particles with the following restriction for the alternatives A with respect to B (here, ζ refers to the independent argument, a time for Type-2, and an event for Type-3):

\[(46)\]
\[\forall X \exists A \forall i \forall i'[\text{B(i}(X)(\xi) \land B(i')(F)(\xi) \rightarrow B(i) \leq B(i')] \]

Roughly, B applied to X indicates a development that is at most as fast as the development that B applied to F indicates. The particle already identifies the asserted proposition as indicating the fastest development under consideration. Our examples then are treated as follows:

\[(47)\]
\[\text{Lydia ist schon dréi}_i \text{ Monate alt (uttered at t}_i \text{ in world i}_a \text{) } \]
\[\text{ALREADY}((\lambda i \lambda n \lambda t [\text{MONTHS}(i)(L)(t) = n], 3, \leq_\lambda)(i_a)(t_i)) \]
asserted: \text{MONTHS}(i_a)(L)(t_i) = 3, \]
alternatives: \{ \text{MONTHS}(i_n)(L)(t_n) = n | n \leq_\lambda 3 \}
where \[\forall \text{e} A \forall i \forall i' [\text{MONTHS}(i)(L)(t_n) = n \land \text{MONTHS}(i')(L)(t_n) = 3 \]
→ \[\lambda n \lambda t [\text{MONTHS}(i)(L)(t) = n] \leq \lambda n \lambda t [\text{MONTHS}(i')(L)(t) = n]] \]

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(48) \(\text{Lydia ist schon um dr\'ei} \text{ Uhr angekommen} \) (uttered in world \(i_o\))
\[\text{ASSERTED}((\lambda i\lambda e[\text{TIME}(i)(e) = t], 3\text{PM}, \leq,t,)(i_o)(\text{te}[[\text{ARR}(L)(e)]])\]
alternatives: \(\text{TIME}(i_o)(\text{te}[[\text{ARR}(L)(e)]) = t \land t \leq 3\text{PM}\)
where \(\forall t e A\forall i, i'[\text{TIME}(i)(\text{te}[[\text{ARR}(L)(e)]) = t \land \text{TIME}(i')(\text{te}[[\text{ARR}(L)(e)]) = 3\text{PM}\]
\[\rightarrow \lambda t \lambda e[\text{TIME}(i)(e) = t \leq \lambda t \lambda e[\text{TIME}(i')(e) = t]]\]

(47) singles out those values for \(n\) such that, if we consider a development \(i\) in which the age of Lydia is \(n\) months, and a development \(i'\) in which it is 3 months, then \(i\) is at most as fast as \(i'\). This restricts \(i\) to values \(\leq 3\), otherwise the development in \(i\) would be faster. (48) singles out those values for \(n\) such that, if we consider a development \(i\) in which the time of Lydia’s arrival is \(t\), and a development \(i'\) in which the time of Lydia’s arrival is \(3\text{PM}\), then \(i\) is at most as fast as \(i'\). This restricts \(i\) to values \(\geq 3\text{PM}\), otherwise the development in \(i\) would be faster.

6. Conclusion
In this paper I have developed a uniform treatment of aspectual particles as focus-sensitive operators that express restrictions on the alternatives to the focus. The semantic relations between the particles proposed by L"obner could be recovered for the most part, and completely so for his Type-1 particles. We also arrived at a uniform representation of Type-2 and Type-3 particles, with the help of the notion of the speed of developments.

References

Aspect, Lexical Semantic Representation, and Argument Expression

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Over the last twenty years aspectual notions have been increasingly appealed to in structuring verbal lexical semantic representations and, concomitantly, in formulating principles of argument expression. This move has been further fueled by the significant insights that have emerged from this line of research. Yet, despite the enthusiasm for aspectual notions that their proliferation demonstrates, I propose that such notions are not the panacea that their considerable use would suggest. Although I also have adopted them in my work, my continuing research into lexical semantic representation and argument expression has suggested to me that the links between aspect, lexical semantic representation, and argument expression are not so simple and transparent as they are made out to be. I use this study to reassess the contributions of aspect to lexical semantic representation and argument expression.

The striking acceptance of aspectual notions as a means of structuring lexical semantic representations may have its roots in some well-known drawbacks of lexical semantic representations that take the form of semantic role lists. As often pointed out, semantic role lists are not grounded in a theory of events, leaving them unconstrained and vulnerable to criticism. Aspectual classifications, proposed at least as early as Aristotle and taken up more recently by Vendler (1957), Kenny (1963), and many others, offer a ready-made theory of the ontological types of events, which grounds them in their temporal contours. Furthermore, aspectual classifications have proved their usefulness in accounts of temporal entailments and temporal adverbial distribution. With this incentive, aspectual classes have been increasingly adopted as the appropriate event types for the twin purposes of structuring lexical semantic representations and formulating a theory of argument expression, as I now review. I then consider how well such attempts succeed. I suggest that it is right to ground lexical semantic representations in a theory of event structure, but that the

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1 I thank audiences at BLS and the University of Arizona for their questions and comments. I am grateful to Malka Rappaport Hovav and Talke Macfarland for comments on a draft of this paper. I have been fortunate to collaborate with Malka Rappaport Hovav and Chris Kennedy in the development of many of these ideas. This work was supported by NSF Grant SBR-9616453 and by the Center for Advanced Study in the Behavioral Sciences' general funds.
ontological types of events relevant to argument realization may not all be aspectual in nature. Throughout I try to understand why aspectual notions have proved so attractive as determinants of argument expression.

1. Background
Given this paper’s shortness, I cannot do justice to the large literature on the interactions of aspect, lexical semantic representation, and argument expression, but I review highlights to set the context for a critical reevaluation of previous work.

Aspectual notions are viewed as important to structuring lexical semantic representation. To the extent that such a representation is now seen as taking the form of an event structure, the claim is that the ontological types of events are determined by their temporal contours. Dowty (1979, Chapter 2) reinterprets the predicate decompositions characteristic of generative semantics as reflecting the Vendler aspectual classes. Many have adopted this reinterpretation, including Foley & Van Valin (1984), but for some cautionary notes see Dowty’s own Chapter 3, Van Valin & LaPolla (1997), and section 2. Sample lexical semantic representations for each of Vendler’s aspectual classes from Rappaport Hovav & Levin [RH&L] (1998:108) are given in (1). Of particular note is the analysis of accomplishments as causatives, i.e., as having the form ‘event cause event’ (see (1d)).

(1) a. ACTIVITY: [ x ACT,<MANNER> ]
   b. STATE: [ x <STATE> ]
   c. ACHIEVEMENT: [ BECOME [ x <STATE> ] ]
   d. ACCOMPLISHMENT:
      [ [ x ACT,<MANNER> ] CAUSE [ BECOME [ y <STATE> ] ] ]

Since the Vendler classes define a set of event types in terms of their temporal contours, their predicate decompositions would be expected to be temporal in nature. Yet representations such as those in (1) are only temporal if the primitives themselves are given such an interpretation, for instance, as Dowty (1979:73-78, 139-145) does for BECOME.

In recent years there have been a range of efforts to make syntactic structures more abstract so that semantic distinctions can be retained in syntactic structure. One consequence is a line of work that syntacticizes event structure (e.g., Arad 1998; Borer 1998; Ritter & Rosen 1998; Erteschik-Shir & Rapoport 1997; Slabakova 1997). This work uses aspectual considerations to motivate syntactic

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2 Although this paper calls into question the use of an aspectually-grounded semantic representation in accounts of argument realization phenomena, such representations are most likely necessary for accounts of temporal properties of events, but these properties are not the topic of this paper.

3 As Dowty (1979) notes, the representation ‘event cause event’ permits atelic accomplishments. Since prototypical accomplishments are telic, many limit them to the subtype ‘activity cause achievement’, as in (1d) from RH&L (1998).
structure, such as the inclusion of explicit Aspect or Event Phrases among the functional projections of a sentence (e.g., Borer 1998; McClure 1993; Ramchand 1997; Travis 1991, 2000) or the association of AgrO with notions of delimitation or telicity (e.g., Ritter & Rosen 1998; van Hout 1996). (See Rosen (1999) for discussion.)

Aspect has also been said to figure in argument expression. This idea dates back at least to Hopper & Thompson’s (1980) inclusion of “telicity” and “punctuality” among the semantic components of transitivity. Since then aspctual notions have increasingly been included among semantic determinants of argument expression, even if different researchers cite different, though overlapping, aspctual notions, including measure, delimiter, incremental theme, telicity, and accomplishment. Aspctual notions, particularly telicity, came into prominence as determinants of syntactic behavior when they were implicated in passive nominals (e.g., Fellbaum 1987; Tenny 1987, 1994), middle formation (e.g., Tenny 1987, 1994), and unaccusative diagnostics such as auxiliary selection (e.g., Centineo 1986; Dowty 1991; Van Valin 1990; Zaenen 1993). Van Hout (1996) proposes that many argument expression alternations are instances of event type-shifting—i.e., aspctual reclassification. (e.g., conative, resultative formation, cognate object addition). Some studies (e.g., Ackerman & Moore 1999; Arad 1998; Borer 1998) associate telicity with accusative case, citing accusative/partitive alternations associated with telicity shifts in Finnish and Hebrew, as well as the use in some languages of oblique rather than accusative case for one argument of two-argument atelic verbs.

Ties between objecthood and aspctual notions appear in a range of work. Dowty (1991) includes the notion “incremental theme” among his proto-patient entailments, which determine the object of a transitive verb. “Incremental theme” is the name Dowty gives to the participant in an event that is crucial to determining the event’s boundedness: it defines a homomorphism from its own properties—e.g., its physical extent—to the time course of the event itself (Dowty 1991; Krifka 1989, 1992; Ramchand 1997; see Hay, Kennedy & Levin [HK&L] 1999 for refinement and extension of this notion). Verkuyl (1993:20) proposes a compositionality principle, the Plus Principle, which has the effect of requiring objects to contribute to bounding an event; as a result, basically atelic transitive verbs such as push must be analyzed as not being true transitives (329-349). Tenny (1987, 1994) proposes a strong and explicit role for aspect in argument expression, as embodied in her Aspectual Interface Hypothesis.

The universal principles of mapping between thematic structure and syntactic argument structure are governed by aspctual properties. Constraints on the aspctual properties associated with direct internal arguments, indirect internal arguments, and external arguments in syntactic structure constrain the kinds of event participants that can occupy these positions. Only the aspctual part of thematic structure is visible to the universal linking principles. (Tenny 1994:2)
2. Disentangling the Aspectual Notions

With this background I now try to disentangle aspectual notions from each other and from other semantic notions. Sometimes what is taken to be an aspectual generalization might in fact be based on a nonaspectual semantic notion. A well-known instance of such a confusion is presented by Lakoff’s purported stativity tests (1966), many of which turn out to be tests for agentivity (Dowty 1979:112; Levin & Rappaport Hovav [L&RH] 1995:170-171). The appropriate criterion underlying these diagnostics was misidentified because so many nonstative verbs are agentive, and only once these two notions were teased apart did it become clear that agentivity rather than stativity was critical to some tests. I explore the interrelations between an aspectual and a nonaspectual notion—accomplishment and causative—and then between two aspectual notions—incremental theme and telicity.

2.1. The Independence of Causation and Telicity

Many researchers working on argument expression identify the notion “accomplishment”—traditionally defined as a durative event with a set terminal point—with the notion “causative,” including Sybesma (1992), Van Valin and colleagues (Foley & Van Valin 1984; Van Valin 1990). This proposal is often attributed to the discussion in Chapter 2 of Dowty (1979). However, in Chapter 3 Dowty shows that these two notions cannot be so readily equated and proposes that the temporal properties of accomplishments are better explained in an interval semantics. (This move is not surprising given that Dowty’s analysis of CAUSE is not temporal in nature (1979:99-110).) Nevertheless, the causative analysis of accomplishments continues to be adopted in work on argument realization, despite further studies affirming the independence of the notions “accomplishment” and “causative” (HK&L 1999; Pustejovsky 1991; Van Valin & LaPolla 1997).

It is not hard to show that not all causatives are accomplishments. Certain atelic—i.e., temporally unbounded—verbs such as intransitive fly or bounce have causative uses that are atelic, as illustrated by their cooccurrence with for rather than in adverbials in (2). In fact, McCawley (1976) argues that causation cannot be reduced to any aspectual notion, and Van Valin & LaPolla (1997:97) show there are verbs of every aspectual type with causative uses of the same aspectual type.

(2) a. Robin flew a kite for an hour/∀ in an hour.
   b. Lee bounced the ball for ten minutes/∀ in ten minutes.

Nor are all accomplishments causatives, notwithstanding persistent assumptions to the contrary. I first consider manner of motion verbs and then, briefly, verbs of consumption. Manner of motion verbs with goal phrases, as in (3), are frequently used to exemplify telic predicates.

(3) Kim jogged to the store.
Two subevents are identifiable in such examples; in (3) these are an event of jogging and an event of arriving at the store. Some have claimed these subevents are causally related. Thus, Croft gives *The boat sailed into the cave* the paraphrase ‘the activity of sailing causes the motion to come about’ (1991:160), while Van Valin (1990:224, (3d)) proposes that *Susan ran to the house* is represented as in (4).

(4)  \[\text{run}'(\text{Susan})] \text{CAUSE [BECOME be-at'](house, Susan)}\]

I present several reasons drawn from L&RH (1999) for rejecting a causative analysis. For additional reasons, see Van Valin & LaPolla (1997), who argue that a noncausative analysis is preferable to Van Valin’s earlier causative analysis.

The syntax of such examples suggests a causative analysis is inappropriate. Prototypical lexical causative verbs such as *kill* or two-argument *break* are transitive, and, in fact, RH&L (1998) argue for a theory of argument realization that requires causative events to be realized by transitives (though it does not require all transitives to be causatives); see section 5. Yet events of motion in some manner to a goal are not expressed with a transitive verb, as would be expected on RH&L’s theory.

The temporal relation between the subevents in expressions of manner of motion to a goal is different from that in lexical causatives. L&RH (1999) point out that in sentences such as (3), the subevents are necessarily temporally dependent: they unfold together. In (3) the jogging continues precisely as long as the going to the store does. In contrast, in true lexical causatives the subevents need not be temporally dependent. L&RH cite the examples in (5), pointing out that in (a) the piano playing may have been protracted, but the waking up could have taken an instant, in (b) Terry’s decision could have been made well before Sandy hears of it, and in (c) the act of putting poison in the soup does not extend to the point of death.

(5)  

a. Casey’s piano playing woke the baby.

b. Terry shocked Sandy by deciding to run for office.

c. The widow murdered the old man by putting poison in his soup.

(L&RH 1999:211, (28))

Like manner of motion verbs, sound emission verbs are found with goal phrases to describe motion towards a goal, as in *The truck rumbled into the garage*, and again two subevents can be perceived: a motion event and a sound emission event. However, as L&RH (1999) note, the way in which the verb and the goal XP are associated with what are understood to be the causing and resulting subevents differs for each verb type. In (6a), the running—denoted by the verb—causes the movement into the room—denoted by the XP, but in (6b) the movement into the room—denoted by the XP—causes the rustling—denoted by the verb.

(6)  

a. Terry ran into the room.

b. Terry rustled into the room. (L&RH 1999:206, (15))
In contrast, when verbs of these two types occur in reflexive resultatives, as in (7), which L&RH (1999) argue do receive a causative analysis, the verb is always associated with the causing subevent and the XP with the resulting subevent. Thus, in (7a), the walking—denoted by the verb—causes the exhaustion—denoted by the XP—and in (7b), the whistling—denoted by the verb—causes the dryness—denoted by the XP.

(7)  a. Tracy walked herself to exhaustion.
     b. The kettle whistled itself dry.

L&RH (1999) argue that although conceptually there are two subevents in sentences with manner of motion or sound verbs plus goal phrases, in event structure terms they involve a single event (i.e., the two subevents are predicated of one event variable). This event structure is reflected in the temporal dependence between the subevents. If such examples have a simple event structure, there is no reason to assume a fixed correlation between certain meaning components and certain syntactic categories since the relevant components are associated with the entire event. But if reflexive resultatives are causatives and, thus, truly bieventive, then each subevent has a fixed role in the larger event and, hence, a fixed expression. The result is the invariant meaning-form correlation in (7). Once again, there is reason not to treat the telic uses of manner of motion verbs as causatives.

I now turn to verbs of consumption, such as eat and drink, which are often mentioned in the literature on telicity.\(^4\) As is well known, these verbs are activities when objectless or taking a nonbounded object, but accomplishments when taking a bounded object, as illustrated in (8) with the progressive-to-perfect entailment test.

(8)  a. Pat is eating. $\Rightarrow$ Pat has eaten. (ACTIVITY)
     b. Pat is eating rice. $\Rightarrow$ Pat has eaten rice. (ACTIVITY)
     c. Pat is eating a plum. $\not\Rightarrow$ Pat has eaten a plum. (ACCOMPLISHMENT)

If accomplishments are causatives, then verbs of consumption should have a causative analysis, at least, when telic. Yet it seems unsatisfying to have the telicity of sentences with these verbs determine whether they receive a causative analysis, since lexical causative verbs such as kill or transitive break are uncontroversially assigned a causative analysis whether their objects represent a bounded quantity or not and thus whether the uses are telic or not, as shown in (9).

(9)  a. Kelly broke the glass in 10 seconds flat/#for 10 seconds.
     b. Kelly broke crystal for/#in an hour.

\(^4\) Verbs of creation such as build are often discussed together with verbs of consumption, and it appears that the arguments presented here against a causative analysis of verbs of consumption could be extended to these verbs as well.
One solution is simply to assign verbs of consumption a causative analysis generally, as proposed by Jackendoff (1990), whose representation for eat is in (10).

\[(CAUSE([\text{Thing}])^A, [\text{GO}([\text{Thing}]_{<A>}, [\text{TO} [\text{IN} [\text{MOUTH-OF} [\alpha]]]])])\]  
(Jackendoff 1990:253, (20a))

Jackendoff does not adopt a bieventive analysis of causatives, but assuming a bieventive analysis is preferable (Dowty 1979; Parsons 1990), the two subevents of a consumption event would probably be an event of ingesting food and one of the food diminishing in quantity. (This analysis differs somewhat from Jackendoff’s, but seems to better capture what is relevant to the aspektual properties.) However, verbs of consumption show a necessary temporal dependence between these subevents: in eating, the ingesting and the consuming unfold together. This dependence is not characteristic of lexical causatives (see (5)). It seems best to assign verbs of consumption a simple event structure, with boundedness of the event determined by boundedness of the stuff denoted by the direct object—or more accurately, a spatial property of this stuff, its volume (HK&L 1999). A causative analysis of these verbs seems unmotivated, as Van Valin & LaPolla (1997) also argue.

2.2. The Independence of Incremental Theme and Telicity

Accounts of telicity often refer to the notion “incremental theme” or a comparable notion, such as Tenny’s “measure” (1994:94-95) or Verkuyl’s “odometer” (1993:221-224). Despite suggestions to the contrary, events may have an incremental theme without being telic, as argued by Filip (1999), HK&L (1999), Jackendoff (1996), Krifka (1992), L&RH (1995), Ramchand (1997), among others. The independence of these notions can be illustrated with “degree achievements,” Dowty’s (1979) name for a set of change of state verbs, mostly based on gradable adjectives, which display ambiguous telicity (Abusch 1986; Bertinetto & Squartini 1995; Dowty 1979; HK&L 1999). They include cool, lengthen, and widen. Each degree achievement can be interpreted as telic, as in (11a), or atelic, as in (11b). These verbs can be used transitively as well, and they again manifest ambiguous telicity, as shown in (12).

\begin{enumerate}
\item a. The soup cooled in an hour.  
\item b. The soup cooled for an hour.  
\end{enumerate}

\begin{enumerate}
\item a. The cook cooled the soup in an hour.  
\item b. The cook cooled the soup for an hour.  
\end{enumerate}

As HK&L (1999), Jackendoff (1996), and Ramchand (1997) point out, the gradable adjective associated with a degree achievement defines a scale, and it is the boundedness of this scale that determines the telicity of the event. The scale exists
whether it is bounded or not and, hence, whether the event is telic or not. Just because a component of an event can be used to judge its progress, doesn’t mean that this component—or the event itself—has to be bounded.

3. **Certain Aspectual Distinctions Do Not Influence Argument Expression**

In this section I reconsider the role of aspectual distinctions in argument expression, particularly given claims as strong as Tenny’s Aspectual Interface Hypothesis (1987, 1994). As I show, many grammatically-relevant semantically-coherent verb classes à la Levin (1993) contain aspectually heterogeneous members; that is, their members do not share the same temporal properties. Given that the class members nevertheless show the same argument expression options, aspectual notions cannot be the sole determinants of argument expression.

A survey of the verb classes in Levin (1993) reveals classes containing both activity and semelfactive verbs. Semelfactive verbs—representing perhaps the least studied aspectual class—describe instantaneous events that do not involve a definite change, such as beep, blink, cough, and tap (Smith 1991). Semelfactives are known to be related to activities. A semelfactive verb may name a punctual happening or a series of repetitions of this happening; for example, the verb tap may describe one tap or many. Repetitions of such punctual happenings may be construed as simple events—specifically, as activities—rather than as iterated events, as is the case when events of other aspectual types are repeated. I use the term “semelfactive verb” to refer to a verb which allows a semelfactive interpretation, recognizing that such a verb also permits repetitive, durative uses. In fact, Olsen (1997) proposes that durativity is a privative property, and she characterize semelfactives as underspecified for durativity and activity verbs as necessarily durative. Each verb class in (13) contains verbs that pattern together according to Levin (1993), yet their members differ as to whether they are basically semelfactives or basically activities.

(13) a. **VERBS OF IMPACT:** bang, batter, beat, hit, kick, pound, rap, slap, smack, tap, thump, thwack, whack, …

b. **VERBS OF LIGHT EMISSION:** flash, flicker, gleam, glisten, glitter, shine, sparkle, …

c. **VERBS OF SOUND EMISSION:** bang, buzz, creak, hum, jingle, rumble, rustle, squeak, thud, …

d. **VERBS OF SUBSTANCE EMISSION:** gush, ooze, puff, spew, spurt, squirt, …

Moving beyond these classes, Levin (1999) points out that both activity and semelfactive verbs are found in reflexive resultatives and with out-prefixation, as in (14) and (15), respectively; in contrast, causative change of state verbs resist these environments. The existence of a shared pattern of grammatical behavior supports the assignment of a common event structure to both activity and semelfactive verbs,
as argued in Levin (1999). Consequently, the inventory of event types relevant to argument expression cannot include aspectually-defined activity and semelfactive event types, and Levin suggests that a nonaspectual definition of the relevant event type might use L&RH’s (1995) notion “internally caused event.”


c. By that time Sophie had swept and scrubbed herself into a state when she could hardly move. (D. Wynne Jones. *Howl’s Moving Castle*. New York: Greenwillow. 1986. p. 43)

d. At his current pace, however, Sauerbrun would kick himself into the NFL record book ... (S. Mickles. *Murray Ready to End Davis’ Reign. The Advocate*. Baton Rouge, LA. October 10, 1997. p. 1D)


b. Stockowski and Dixon were outjumped by bigger, stronger girls ... (J.C. Cotey. *Parents Enjoy Sweat Rewards. St. Petersburg Times*. July 10, 1999. p. 7C)


Another example is presented by the English denominal verbs that Clark & Clark (1979) label “locatum verbs”: verbs such as *roof* or *butter* that are paraphrasable as ‘put entity named by the base noun on’. As Harley (1999) observes, the telicity of these verbs depends on the base noun. When it is a count noun (e.g., *blindfold*, *roof*, *saddle*, *shoe*), the related verb is necessarily telic, as shown in (16). When it is a mass noun (e.g., *butter*, *flour*, *grease*, *water*), the related verb may be telic or atelic, as illustrated in (17).\(^5\) This subdivision between necessarily telic and

\(^5\) Harley (1999) describes locatum verbs with mass noun bases as atelic, but aspctual tests, as shown in (17), suggest ambiguous telicity along the lines shown by degree achievements. The actual interpretation as telic or atelic appears to depend on contextual conditions of the type that HK&L (1999) identify for degree achievements. Harley (1999) also extends her claim about the effect of the base noun on the related verb’s telicity to Clark & Clark’s (1979) location verbs (e.g., *bag*, *can*, *garage*). I do not discuss these verbs in the text because I believe the generalization is not as straightforward as Harley suggests, and space limitations prevent me from discussing the contextual conditions that need to be taken into account to fully assess this claim.
variable telicity locatum verbs is not surprising as Olsen (1997) argues that telicity, like durativity, is a privative feature. What matters is that despite differences in their aspectedual classifications, locatum verbs constitute a grammatically-relevant semantically-coherent verb class à la Levin (1993).

(16)  
  a. Mary saddled the horse in 5 minutes/#for 5 minutes.  
  b. The blacksmith shoed the horse in an hour/#for an hour.  
       (Harley 1999:79, (12a,d))

(17)  
  a. Susan watered the garden in an hour/#for an hour.  
  b. Bill greased the chain in 5 minutes/#for 5 minutes.  
       (Harley 1999:79, (13a,b))

A third example is presented by yet another semantically-coherent set of verbs with uniform behavior that nevertheless contains some verbs that are necessarily telic and others that display variable telicity. As noted in section 2.2, degree achievements may have telic or atelic uses, both when transitive and when intransitive; (at)elicity, then, has no effect on the expression of their arguments. Furthermore, together the transitive and intransitive uses of a degree achievement instantiate the causative alternation characteristic of change of state verbs since the transitive use means roughly ‘cause to V-intransitive’. In fact, the class of degree achievements is only singled out in aspectedual studies; other lexical semantic studies simply include them in the larger class of change of state verbs along with change of state verbs that are necessarily telic (e.g., break, crack). The reason is that all these verbs pattern together with respect to a wide range of grammatical behavior, such as the causative alternation, as set out in Fillmore (1970) and Levin (1993).

Similarly, although verbs of inherently directed motion are often classified as telic (e.g., arrive, come, go), L&RH (1995) identify a class of “atelic verbs of inherently directed motion” (e.g., ascend, rise, fall), with both telic and atelic interpretations, as shown in (18). Thus, like change of state verbs, verbs of inherently directed motion may be necessarily telic or may vary in telicity. Yet they all share the same behavior (Levin 1993). Furthermore, studies of unaccusativity, which often mention these verbs, do not find differences among them with respect to unaccusativity diagnostics, at least in English (L&RH 1995:172-173).

(18)  
  The plane descended in/#for 10 minutes.

Finally, the notion “incremental theme” cannot be linked solely to objecthood. Tenny (1994:11, (9iii)) proposes that: “Direct internal arguments are the only overt arguments which can ‘measure out the event’,” where “measuring out” is Tenny’s counterpart to “incremental theme.” However, as Dowty (1991) points out, the transitive verbs in (19) have incremental theme subjects; analyzing them as unaccusatives, allowing Tenny’s generalization to be maintained, is not straightforward.
(19) a. John entered the icy water (very slowly).
   b. The crowd exited the auditorium (in 21 minutes).
   c. Moving slowly but inexorably, the iceberg took several minutes to pierce the ship’s hull to this depth.

(Dowty 1991:570, (25))

The irrelevance of telicity and other aspecual notions to certain facets of argument realization suggests that Tenny’s Aspecual Interface Hypothesis is too strong. As a step towards trying to uncover more effective semantic determinants of argument expression, the next section asks why the related notions “telicity” and “accomplishment” are so often cited as organizing notions of lexical semantic representation and as determinants of argument expression.

4. **What Is the Source of the Appeal of Aspecual Notions?**

I suggest aspecual notions prove appealing because with their temporal grounding, they provide an independent understanding of the notion “complex event”—an event made up of two events—and the related, but also hard-to-pin-down, notion “causative event”—an event consisting of two causally-related events. Such notions figure prominently in the generative semantics literature, where they enter into the explanation of various phenomena, such as the interpretation of adverbials (McCawley 1973; Morgan 1969). Tying the notions to a particular Vendler aspecual type gives a new—and, for that reason, potentially useful—perspective on them and might be the reason why so many studies continue to pursue this link.

I now review two proposals concerning in what sense accomplishments are complex events. The class of accomplishment verbs is quite heterogeneous. Depending on their interests and goals, researchers have focused on two distinct subclasses of this class as “core” accomplishments, leading to two different analyses.

The first analysis, presented in section 1, treats accomplishments as causatives. This analysis takes core accomplishments to include causative change of state verbs. An accomplishment is given a causative lexical semantic representation of the form ‘event cause event’, which is often instantiated as ‘activity cause achievement’, as in (1d) (Foley & Van Valin 1984; RH&L 1998; Van Valin 1990). The noncausative counterparts of change of state verbs, as achievement verbs, are given a distinct representation, as in (1c). The relation between the causative and noncausative uses of change of state verbs is brought out by embedding the achievement event structure in the accomplishment event structure; compare (1c) and (1d).

The second analysis, which I refer to as the noncausative analysis, takes the core accomplishments to be predicates formed from the composition of a verb and a delimiting NP or XP, as in *eat an apple* or *run to the store*. In each instance, the verb denotes a process and its object or an XP delimits this process, defining a result state. Telic events are complex events defined as transitions from one event to a second, often a transition from an atelic process to a result state (Pustejovsky 1991,
1995; van Hout 1996). On this analysis, all telic events—whether achievements or accomplishments—are analyzed as transitions and, hence, as complex events; this includes both causative and noncausative uses of change of state verbs.

Both analyses acknowledge accomplishments are complex events. They differ as to whether accomplishments are analyzed as causatives and as to whether achievements are said to be complex events. A serious drawback of the causative analysis is that its uniform treatment of all accomplishments as causatives was shown to be problematic for argument expression purposes in section 2.1. The noncausative analysis unifies all telic predicates by providing them with the same event structure; however, since telicity does not seem to be a determinant of argument expression, as discussed in section 3, this approach does not provide an appropriate basis for a theory of argument realization. Furthermore, the noncausative analysis assigns telic uses of verbs of consumption and verbs of manner of motion the same event structure as lexical causative verbs. The discussion in section 2.1 questioned whether these should all receive a causative analysis, and, this, in turn, suggests that they should not all have the same event structure, whatever it might be.

5. Consequences for Event Structure and Argument Realization

My own research, much of it with Malka Rappaport Hovav, agrees that a lexical semantic representation must incorporate a fundamental distinction between complex and simple events. Building on RH&L (1998), L&RH (1999) argue that the notion "complex event" should be equated with the notion "causative event," and that the notion "causative event" should be cut loose from the notion "accomplishment." On this analysis the simple/complex event distinction is not rooted in traditional aspectual notions. The distinction might appear to be aspectual in nature, as assumed in RH&L (1998), because there is considerable overlap between the sets of accomplishments and causatives; however, the notions "causative" and "accomplishment" are independent, as supported by the evidence in section 2.1, which shows that there are noncausative accomplishments and atelic causatives.

The linguistic representation of an event, then, is characterized according to whether it is complex, consisting of two causally-related subevents, or simple, consisting of a single subevent. As mentioned in section 2.1, L&RH (1999) posit that what is essential to a causative event is that its subevents are not necessarily temporally dependent. L&RH (1999) argue that an event with perceived subevents that are necessarily temporally dependent, as in Kim jogged to the store, is treated linguistically as a simple event; they propose that the subevents are "coidentified"—that is, they could be said to be predicated of the same event variable.

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6 It is possible that the notion "transition" that figures in the noncausative approach’s definition of "complex event" may have a place instead in the formalization of telicity since it provides a way of characterizing what makes an event bounded; however, "incremental theme" and related notions may be preferable for this purpose. It is the notion "incremental theme" and its relatives that figure in the formalizations of telicity, such as Krifka (1989, 1992), Ramchand (1997), and Verkuyl (1993).
Levin (1999) argues that semelfactives and activities pattern together because both have simple event structures, and it is this shared property that determines their argument realization options. The fact that degree achievements—which vary in telicity—pattern with necessarily telic change of state verbs follows because the aspectual characteristics of degree achievements are not relevant to the simple/complex event distinction. Telicity in a change of state verb requires that the change in the scalar property associated with a particular verb of change of state be bounded (HK&L 1999). In some instances, the nature of the property itself requires that the change be bounded, as with break. In other instances, boundedness depends on a combination of the nature of the state itself, the nature of the entity that is changing state, and properties of the context (HK&L 1999).


(20) **THE ARGUMENT- ISI PER- SUBEVENT CONDITION:** There must be at least one argument XP in the syntax per subevent in the event structure.

If correct, the Argument-Per-Subevent Condition requires that event structures with two subevents give rise to sentences with a subject and an object, while simple event structures give rise to sentences which only need a subject. RH&L (1998) demonstrate that the distinct argument expression options manifested by two semantic classes of two-argument verbs—verbs of surface contact and motion (e.g., wipe, rub, scrub, sweep) and the previously discussed change of state verbs—can be tied to differences in the complexity of the events denoted by the verbs in each class. Verbs of surface contact and motion have a simple event structure with a single subevent, while, as causatives, change of state verbs have a complex event structure with two subevents. By the Argument-Per-Subevent Condition, change of state verbs are expected to be transitive, while verbs of surface contact and motion need not be, though they describe events with two participants. Consistent with this expectation, verbs of surface contact and motion are found with unspecified objects, while change of state verbs are not (RH&L 1998).

(21) a. Leslie swept (the floor).

b. *Kelly broke again tonight when she did the dishes.

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7 Goldberg (in press) points out that under certain conditions change of state verbs can appear with omitted objects; however, Wright & Levin (2000) note that surface contact verbs and other transitive verbs whose event structure consists of a single subevent allow the omission of their objects even when these special conditions are not met. Thus, although RH&L's conditions on argument realization need to be modified to allow for restricted argument omission with change of state verbs, Wright & Levin contend that RH&L's basic analysis remains valid.
The two verb types are also predicted to vary in terms of permissible objects (RH&L 1998). Since change of state verbs must express both arguments (an agent and a patient), their object must be the patient. However, since verbs of surface contact and motion need only express their agent, they are free to occur with other than “normal” objects. In fact, in (22a) *wipe*’s object is understood as an instrument; the table is taken to be the wiped surface despite its expression in a PP. In contrast, though in (22b) *break*’s object, *the stick*, is a prototypical instrument, it is nevertheless understood as the patient; (22b) cannot mean ‘Kelly broke the fence’.

(22) a. Leslie wiped the cloth over the table.
    b. Kelly broke the stick over the fence.

6. Aspect Once More

In conclusion, I have reexamined the contribution of certain well-known aspectual notions to the structuring of lexical semantic representation and the characterization of argument expression. I have argued that some aspectual notions are not semantic determinants of argument expression; however, I propose aspeclual notions broadly construed still have a part to play in lexical semantic representation and argument expression. As reviewed in section 5, L&RH (1999) suggest that the criterion for determining that an event with two conceptually-identifiable subevents is a causative—and hence complex—event rests on the temporal relations between its subevents: these subevents cannot be necessarily temporally dependent. Thus, the notion “complex event” involves the event’s temporal contour, even if it does not involve a familiar aspectual notion. Though I have argued that one commonly cited notion, “telicity,” is not a determinant of argument expression, I do not deny its importance. However, its contribution is in other domains, such as the computation of the temporal interpretation of a sentence. By challenging certain received assumptions, this paper undoubtedly raises as many questions as it answers, but I hope that in so doing it points to fruitful directions for further exploration.

References


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8 This statement needs to be qualified. In some languages telicity influences a superficial facet of argument expression: the morphological case of certain arguments (e.g., accusative/oblique case alternations); however, what matters here is that telicity does not directly determine grammatical function, which is what I take to be the core of argument expression.
Aspect, Lexical Semantics, and Argument Expression


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From Imperfective to Progressive via Relative Present

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1. Introduction

According to the recent typological studies (Comrie 1976; Dahl 1985; Bybee et al. 1994), grammatical forms expressing ongoing events fall into two major classes: specifically progressive forms are opposed to more general imperfective forms, which are also used in habitual and stative contexts. However, as pointed out by Dahl, these contexts are relatively infrequent, which facilitates diachronic shifts from imperfective to progressive and vice versa (1985:93). He mentions two instances of the Progressive-to-Imperfective shift, in Hindi/Urdu and Punjabi. Comrie (1976:101) cites evidence from Yoruba, where the Progressive\(^1\) form is used as a general Imperfective by some speakers, which apparently reveals a similar shift in progress (see also (Bybee et al. 1994:141) for further examples).

In contrast with Dahl's original hypothesis (1985), the grammaticalization-based theory of tense and aspect systems outlined in (Bybee & Dahl 1989) and elaborated in (Bybee et al. 1994) claims that the Progressive-to-Imperfective developmental path is unidirectional. The major piece of empirical evidence in favor of this claim is given by the strong cross-linguistic tendency for Progressives to be expressed by periphrastic constructions (Dahl 1985:91), which shows that they emerge at early stages of grammaticalization. Most importantly, however, the possibility of the Imperfective-to-Progressive shift is ruled out by the general unidirectionality hypothesis, which stipulates that the semantic evolution of grammatical items is universally directed from more specific to more general meanings (Bybee et al. 1994:127).

It is clear that no claim of unidirectionality can be empirically verified: if the reverse development is not attested, it does not mean that it is impossible. Yet even a single instance of the reverse development would suffice to falsify such a claim. The major goal of the present paper is to present an example of the Imper-

\(^1\) Here and below, categorial labels with capital initial letters stand for language-specific grammatical items.
fective-to-Progressive development and thus to show that the Progressive-to-Imperfective grammaticalization path is not unidirectional. This claim is based on a contrastive analysis of two closely related languages, Tundra and Kolyma Yukaghir. More specifically, I will argue that the Progressive marker in Tundra Yukaghir has developed from a former Imperfective. This "backward" shift has been conditioned by two factors: the development of a newer Habitual suffix and the grammaticalization of the older Imperfective as a Relative Present marker in medial verb forms.

2. Tense and Aspect in Yukaghir: an overview
The Yukaghir tense and aspect system is clearly aspect-dominated. The only morphologically marked tense opposition is between Future and non-Future. The temporal interpretation of a finite verb without the Future marker is constrained by its aspeclual characteristics, cf.:\(^2\)

\[
\begin{array}{lll}
(1) & \text{a. } & \text{köke-}j-i <\text{reach-PVF-3PL:TR}> '\text{(they) reached (a destination)}' \\
& \text{b. } & \text{goñ a-d’Ä-e-}i <\text{bow-ITER-3PL:INTR}> '\text{(they) are bowing/bowed}' \\
& \text{c. } & \text{wie-}a <\text{make-3PL:TR}> '\text{(they) made}' \\
& \text{d. } & \text{wie-mu-} a <\text{make-PROG-3PL:TR}> '\text{(they) are/were making}' \\
& \text{e. } & \text{wie-nun-} a <\text{make-HABG-3PL:TR}> '\text{they make/used to make}'
\end{array}
\]

There are three morphological layers of Perfective vs. Imperfective marking. The first layer (below, Internal Aspect) comprises of a non-productive but rather common Perfective suffix (TK -j-, cf. (1a)) and a handful of highly lexically constrained suffixes signifying various types of multiple-event situations (cf. (1b)) (Krejnovič 1982:124-135). Secondly, there are two highly regular derivational suffixes, which can be referred to as light (TK -nu-) and heavy (T -nun-, K -nun(mu)-) Imperfective, cf. (1d) and (1e). The unmarked counterpart of an Imperfective verb is interpreted as perfective, cf. (1c). The semantic distinction between the light and heavy Imperfective relates to the progressive vs. habitual opposition in both Tundra and Kolyma Yukaghir, yet their functional distribution constitutes a significant point of divergence between these languages (see Section 3 for details and examples). The third layer of aspect marking only exists in medial forms, i.e. in non-finite forms

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From Imperfective to Progressive

employed for clause-chaining. The medial forms fall into three classes: Perfective same-subject forms, Imperfective same-subject forms, and aspect-neutral different-subject forms, cf.:

(2) a. wie-relek <make-SS:PFV> 'having made, (he) made and then…'
b. wie-rë <make-SS:IPFV> '(when) making, (he) made and…'
c. wie-da'ë a <make-3SG-DS> '(when) he was making, he made and…'

The Imperfective and different-subject forms are unmarked for the anterior vs. simultaneous distinction, whereas the Perfective forms enforce the anterior interpretation.

3. The semantic divergence of Imperfective suffixes

3.1 The light suffix: Progressive vs. Imperfective

In both Yukaghir languages, the light Imperfective encodes progressive situations cf. (3) and (4). Since there is no obligatory past vs. present distinction, the time of reference is determined by the context and/or speech situation; in each pair of examples, sentence (a) illustrates present reading determined by the speech situation, (b) appears in the past narrative context.

(3) a. "neme-le wie-nu-më ?" "me+pandin-nu-jë ".
T what-FOC make-PROG-OF:1/2 AFFMT+COOK-PROG-INTR:1SG
"What are you doing?" "I'm cooking."
b. qad'ir la:me-gi-tege me+qohi-nu-m kötkej-da-ha
DP dog-3-AUG AFFMT+dig-PROG-TR:3SG reach-3-DS
"When he came, his huge dog was digging."

(4) a. tet-ek ä äi:-nuë ile
K you-FOC search-IPFV-3PL:OF
"It is you whom they are looking for!"
b. tā prolubo-ge egedie-nu-j, tude jo:-gele
that ice.hole-LOC look.in-IPFV-INTR:3SG his head-ACC
niicu-nu-m comb-IPFV-TR:3
"He was looking into that ice-hole and combing his hair." (Nikolaeva 1989:T49)

3 All Tundra Yukaghir examples are taken from a corpus collected by Gavrila Kurilov (Russian Academy of Sciences, Yakut department). Kolyma Yukaghir examples come either from the collection published by Irina Nikolaeva in 1989 (references to particular texts are given in brackets) or from texts recorded in 1992 by the author.
In Kolyma Yukaghir, the light suffix is also used in habitual (5) and generic (6) contexts:

(5) a. qodo :ti:t kebe-j- nu-l'e\l\' i?
K how here-ABL go-PFV-PFV-INFR-3PL:INTR
‘How do people (usually) get out of here?’ (Nikolaeva 1989:T31).
b. qadmudul-e u:ji:-nu-l'e\l\' a: k\ödin el+u:j-o:-nu-l'e
ring-INST work-PFV-INFR-3PL:TR right NEG-work-RES-PFV-INFR(3)
‘They would make a ring, but it would never fit’ (\c{c}IÅ‡Á‡ 1989:T3).

(6) pon'qonodo colhoror-le qodit lej-nu-m?
K lynx hare-ACC why eat-PFV-TR:3
‘Why does the lynx eat the hare?’ (Nikolaeva 1989:T3).

Further, this suffix is compatible with stative verbs. These forms can encode both specific continuous situations (7a) and regularly recurrent states (7b):

(7) a. naha: i:s' meIle-t qodo:-nu-j el+malaj-nu
K [very long listen-SS:PFV] lie-PFV-INTR:3 NEG+fall.asleep-PFV(3)
‘He was lying sleeplessly for a very long time.’
b. puge-din el+al'a:-\äuön qodo:-nu-j
summer-DAT [NEG+melt+PRIV] lie-PFV-INTR:3
‘It (always) lies without melting till summer.’ (Nikolaeva 1989:T35)

The Tundra Yukaghir light Imperfective never occurs in habitual and stative contexts. Hence, the semantic divergence between the light Imperfective suffixes in Tundra and Kolyma Yukaghir fits the cross-linguistic distinction between progressive and imperfetive.

3.2 The heavy suffix: obligatory vs. optional Habitual

In Kolyma Yukaghir, the heavy Imperfective serves as an alternative encoding option for habitual situations. Generally, the heavy option is chosen to express some sort of contrast between the present and the past. It signals that the situation being described is conceived of as characteristic of the present in contrast to what used to be the case in the past (cf. (8a)), or vice versa (cf. (8b)). Such a sentence usually contains an adverbial expression specifying the time reference:
(8) a. ta:t n'e-qa:nin el+i:bi'l'ie-nunnu:j üi:
K so NEG-when NEG-cry-HAB-INTR:3SG now
'And now he never cries.'
b. tuda: ta:t ed'-u-t moda:-nun-d'i:l'i
long.ago so live-0-SS:PFV sit-HAB-INTR:1PL
'That is how we used to live long ago.'

Outside the "contrastive" contexts like in (8), the habitual meaning is routinely expressed by the light Imperfective (cf. (5)).

In Tundra Yukaghir, the heavy marking is required in all habitual contexts, cf.

(9) a. me+pondi:-nun-u: en-d'e-l'e-gi
T AFFMT+let.go-HABG-0-1SG live-AT-PRNM-3
'I (always) let go those of them who are alive.'

b. ojege-lë janil-ek pun-nun-u:m
hare-ACC trap-INST kill-HABG-0-TR:3SG
'He used to kill hares with a snare trap.'

The same suffix is used in generic statements, cf.:

(10) mit kode-n t'u:l el+lew-nun-d'el'i.
T we person-AT meat NEG+eat-HABG-INTR:1PL
'Ve do not eat human meat.'

Furthermore, the heavy Imperfective in Tundra Yukaghir shows a slight tendency towards further semantic generalization, namely, it can encode multiple-event progressive situations. This "invasion" of the heavy Imperfective into the progressive domain is particularly clear in distributive contexts, where the multiplicity of sub-events is determined by the multiplicity of participants involved, cf.:

(11) kinoll'elk ai-nun-u:m.
T whoever shoot-HABG-0-TR:3
'Everybody was shooting.'

Apart from the functional distinctions, the Tundra Yukaghir heavy Imperfective is phonologically reduced with respect to its Kolyma Yukaghir counterpart: In Kolyma Yukaghir, this suffix has two allomorphs, -nun- and -nunnu- (the choice being determined by the following morpheme, cf. (8)), whereas Tundra Yukaghir only has the shorter form. It seems therefore plausible to assume that Tundra Yukaghir represents a next stage of grammaticalization of the heavy Imperfective,
whereby an optional Habitual marker has developed into an obligatory Habitual/Generic.

3.3 Imperfective-to-Progressive hypothesis
The distribution of the light and heavy Imperfective suffixes in Kolyma Yukaghir is quite typical for semantically close items at different stages of grammaticalization: the more specific and phonologically heavier (i.e. younger) Habitual suffix functions as a contrastive encoding option for a sub-meaning of the older Imperfective. In such cases, the marked form generally tends to expand the range of possible contexts. In the course of further grammaticalization this form can become obligatory and thus take over certain sub-meanings of the older one (Bybee et al. 1994:294-295). Precisely this situation is observed in Tundra Yukaghir, where the heavy Imperfective suffix functions as an obligatory Habitual/Generic, while the light Imperfective is left for marking progressive. It seems thus plausible to hypothesize that the Progressive vs. Imperfective divergence between the light Imperfective suffixes has been induced by grammaticalization of the Habitual in Tundra Yukaghir (cf. 3.2), which has replaced the older Imperfective in habitual and generic contexts, thereby restricting its meaning to progressive. This hypothesis will be referred to below as Imperfective-to-Progressive hypothesis.

An alternative explanation of this semantic divergence may be that Tundra Yukaghir preserves the original meaning of the light Imperfective, while in Kolyma Yukaghir this suffix has undergone the Progressive-to-Imperfective grammaticalization. Note, however, that this hypothesis entails the assumption of general-to-specific development for the Habitual in Kolyma Yukaghir. The point is that if the light Imperfective formerly signified progressive, then the Habitual could hardly be constrained to contrastive contexts, as it is the case now. Indeed, given that there existed two overt imperative suffixes, one of them with habitual semantics, it seems highly unlikely that a grammar would prohibit both of them in non-contrastive habitual and generic contexts. Hence, the Progressive-to-Imperfective hypothesis implies that the heavy Imperfective suffix used to express general habitual (or even habitual/generic) and has been now restricted to contrastive contexts in Kolyma Yukaghir.

At first sight, these hypotheses may seem equally plausible (or implausible). In both cases, it is assumed that the development of one Imperfective suffix has induced semantic specification of the other one. This type of semantic change is widely attested cross-linguistically. To give the closest example, a Habitual can develop from an older general Present as a result of grammaticalization of a newer Progressive; English is a case in point (Bybee et al. 1994:153). However, a closer

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4 This tendency is described by Dahl in terms of "linguistic inflation", or "rhetorical devaluation" (Dahl 1999).
look at the underlying mechanism of semantic change will rule out the Progressive-to-Imperfective hypothesis. This mechanism necessarily involves a shift from optional to obligatory use of some marker. It is this shift that imposes additional constraints on the use of a contrasting grammatical item, thereby endowing it with a more specific meaning (Bybee et al. 1994:294). This development obviously requires that one of the items involved serve as an optional marking alternative for a sub-meaning of the other. The output of this type of change is an opposition between two obligatory markers without semantic overlaps.

In this way, the grammaticalization of an optional Habitual can cause the Imperfective-to-Progressive development of another form, thereby giving rise to a Progressive vs. Habitual/Generic opposition, as suggested by the Imperfective-to-Progressive hypothesis. Yet this mechanism does not allow a Progressive to endow contrastive semantics in a Habitual. Furthermore, it can by no means make a formerly obligatory marker optional. Thus, the Imperfective vs. optional Habitual opposition characteristic of Kolyma Yukaghir could not emerge by virtue of this mechanism.

4. The diachronic link between Habitual and Progressive

The major piece of evidence for the Imperfective-to-Progressive hypothesis is given by the obvious formal similarity between the light and heavy Imperfective, which hints at a diachronic relationship between these suffixes. As will be shown in this section, this relationship implies that the light Imperfective in Tundra Yukaghir was formerly able to express habitual. To put it the other way round, the Progressive-to-Imperfective hypothesis does not allow for the possibility of diachronic link between the light and heavy Imperfective suffixes.

The current phonological shape of the Imperfective suffixes licenses two different diachronic hypotheses. First, the light suffix can be viewed as a result of formal reduction of the heavy one (following a path like -numu- > -num- > -nu-). The light and heavy Imperfective are thus taken to represent two co-existing stages of grammaticalization of the same source item. Yet this means that the light Imperfective has developed from an item with habitual semantics, which has been extended to express progressive meaning (as e.g. in Slavic (Dahl 1985:84)). If so, then a Progressive can only emerge at a next stage of development.

Alternatively, the heavy Imperfective may represent a "frozen" combination of two light Imperfective suffixes, which has been reanalyzed as a single Habitual marker (*[V-nu]-nu- > V-numu-). According to this hypothesis, the habitual meaning was formerly signaled by attaching a second Imperfective suffix to a verb stem which already contains this suffix. An important piece of evidence in favor of this possibility is given by the following synchronic phenomenon. In Kolyma Yukaghir, the combination of the light Imperfective with an Internal Imperfective
suffix (cf. Section 2) tends to function as the heavy Imperfective. In this morphological context, the non-habitual readings of the light Imperfective are virtually excluded, and the resulting forms typically occur in contrastive contexts characteristic of the heavy Imperfective, cf. (8) and (12):

(12) \text{ta:t n'e+anure-t tuda: am-āi:-nu-l'el- i odu-pe}
\text{so RECP+love-SS:IPFV long.ago die-ITER-IPFV-INFN-3PL:INTR Yukaghir-PL}
\text{'That is how the Yukaghirs used to die from love long ago.' (Nikolaeva 1989:T35) }

Examples like in (12) show that the context of another imperfective suffix can enforce habitual interpretation of the light Imperfective. Hence, it may be hypothesized that a similar disambiguation could be achieved by combining two regular imperfective suffixes.

It is clear, however, that this is only possible if habitual belongs to the set of contextual sub-meanings of the suffix involved. For example, the synchronic phenomenon exemplified in (12) does not exist in Tundra Yukaghir, where the current meaning of the light Imperfective suffix is strictly progressive. Hence, this hypothesis also implies that the light Imperfective covered habitual meaning at an earlier stage of development. Since the heavy Imperfective exists in both Yukaghir languages, this observation pertains to the common Yukaghir stage and thus suggests that the modern Tundra Yukaghir Progressive has evolved from a common Yukaghir Imperfective.

To sum up, whatever the specific hypothesis, any diachronic link between a Progressive and a Habitual/Generic must involve an Imperfective, simply because this is the only category which provides a semantic "bridge" between otherwise distinct progressive and habitual meanings. Hence, if the Tundra Yukaghir Progressive had never functioned as a general Imperfective, there could be no diachronic relationship between the light and heavy Imperfective suffixes.

5. Imperfective and Relative Present
If the Imperfective-to-Progressive hypothesis introduced in 3.3 is accepted, it can still be argued that this development is simply not an instance of grammaticalization, insofar as the meaning of the light suffix has been restricted as a result of grammaticalization of a contrasting suffix, rather than by virtue of its own semantic evolution. If so, then the Yukaghir case cannot count as a valid counterexample to the general unidirectionality hypothesis. This section is intended to show that the hypothesized Imperfective-to-Progressive development in Tundra Yukaghir is very similar to genuine grammaticalization, so that there seem to be no empirical reasons to consider it as an essentially different process.
From Imperfective to Progressive

An important structural change in grammaticalization is the rise of paradigmatic oppositions, i.e. of mutual exclusivity among items which are, in principle, semantically compatible and used to co-occur freely at an earlier stage of development (the most commonly cited instance of this phenomenon is the English system of modal auxiliaries). Lehmann (1995:123) describes such grammatical constraints in terms of loss of variability, which is taken to be a major criterion of grammaticalization. Now according to this criterion, the Tundra Yukaghir Progressive is more grammaticalized than the Kolyma Yukaghir Imperfective, since it is paradigmatically opposed to Inferential. Furthermore, this is the only significant structural distinction between these suffixes, hence the only applicable criterion of grammaticalization.

The Inferential suffix (TK -l'el-) is compatible with the Kolyma Yukaghir light Imperfective (cf. (13a)), as well as with the heavy Imperfective suffixes in both Yukaghir languages (cf. (13b) and (14)).

(13) a. jurgu: molho-n o:ti:-gi ilbu-nu-l'el.
  K hole inside-PROL water-3 flow-IPFV-INFR(INTR:3)
  '(It turned out that) the water was flowing through the hole.'

  b. āa:j-e, tabaq-e omni:-n ăomo:ie-pul moj-nunnu-l'el' a:
  tea-ACC tobacco-ACC kin-AT elder-PL hold-HAB-INFR-3PL:TR
  '(They say that) tea and tobacco were usually kept by kin elders.'

(14) tū tude kone-pul-hat tude na:di:j-o:l-hane
  T PRXM his partner-PL-ABL PERS:3SG need-0-RESNR-ACC
  men-nun-l'el-u-m.
  take-HABG-INFR-0-TR(3)
  '(They say that) he used to take from his partners whatever he needed.'

For the Tundra Yukaghir Progressive, such forms are impossible. As shown by examples like in (13a), the progressive and inferential meanings are easily compatible. Hence, the constraint on compatibility appears to be imposed by the grammar (rather than being motivated semantically) and thus constitutes a clear indication of a more advanced grammaticalization. In effect, this constraint draws the light Imperfective suffix out of the domain of derivational morphology and integrates it into an inflectional paradigm. If the Imperfective-to-Progressive development was determined by grammaticalization of the Habitual, as suggested in 3.3, it remains unclear why it should be accompanied by the rise of a paradigmatic opposition between Progressive and Inferential. This opposition indicates that something beyond the influence of a contrasting suffix must have been involved in this process.
As it seems, the additional factor which has played a major role in the Imperfective-to-Progressive shift is grammaticalization of the light Imperfective into a **Relative Present** in medial verb forms, which has taken place in Tundra Yukaghir. If used in an Imperfective medial form (see Section 2), the light Imperfective signifies that the event is ongoing at the time of reference, as determined by the main clause, cf. the contrast between (15a) and (15b):

(15) a. **lewdie-nu-rē t'ar'teqa:n mon-i**

    *eat-PROG-SS:IPFV Ch. say-INTR:3*  
    'While eating, Charchahan said [...]'

    b. **sajre-pul jawner neregej-rē me-jabaː i**

    *eagle-PL all get.struck-SS:IPFV AFFMT-die-3PL:INTR*  
    'All the eagles were shocked and died.'

The light Imperfective suffix is impossible in the Perfective medial forms, since they are incompatible with the relative present reading (see Section 2).

In Kolyma Yukaghir, the light Imperfective does not express relative present, as shown by its compatibility with Perfective medial forms, cf.:

(16) a. **juō-nu-delle mon-i "omos'"**

    *look-IPFV-SS:PFV]say-INTR:3SG [good-INTR:3]*  
    'He looked at it for some time and said "It is good"' (Nikolaeva 1989:T9)

    b. **mido-nu-lle adaː-n ejre-lle jelohude**

    *roam-IPFV-SS:PFV there-PROL walk-SS:PFV back:DIR*  
    'They roamed there for some time and came back.'

The Kolyma Yukaghir Imperfective preserves its essentially aspectual semantics in medial forms, i.e. it signals that the event is viewed as having some internal temporal structure (in the context of a Perfective medial form, it is usually employed to indicate that the event was taking place during a protracted period of time). Thus, both the development of the light Imperfective into the Progressive in finite forms and its grammaticalization into the Relative Present in medial forms took place only in Tundra Yukaghir. To be sure, this observation does not prove that there is a causal link between these processes, yet it strongly suggests that they are not independent of each other.

There are two additional arguments in favor of an intrinsic relation between these processes. To begin with, the relative present and progressive meanings are very similar: in both cases, the suffix signifies that the event is ongoing at the time
of reference, the only difference being that the time of reference is determined by the main clause in one case, but by a broader narrative context in the other. In other words, the Imperfective-to-Progressive and Imperfective-to-Relative Present developments involve essentially the same semantic change. It seems also worth noting that the context of medial clause precludes habitual reading of the light Imperfective, insofar as clause chains establish temporal relations only between individual events. Therefore, this context may have endowed the semantic component "single event" in the light Imperfective suffix (this mechanism of semantic change is described in (Bybee et al. 1994:295-296) for modal meanings developing in subordinate clauses).

More importantly, this hypothesis reveals the semantic motivation for the paradigmatic opposition between the Progressive and Inferential markers. In different-subject medial forms the Inferential signals relative past, so that the light Imperfective and the Inferential are opposed as contrasting members of the same grammatical opposition, cf.:

(17) a. ogomoni ta:t orn'ie-nu-da-ha n'awn'iklie-lë wa:j kelu-l. 

T suddenly [so cry-PROG-3-DS] polar.fox-FOC again come-SF
'Suddenly, when he was crying, the polar fox came again.'

b. ta:t mol-l'el-da-ha sa:nmoni'l-e-le juə" u-mle 

[so say-INFR-3-DS] forest-FOC see-PL-OF:3
'After he had said this, they saw a forest.'

Since the general grammatical constraint on compatibility with the Inferential is semantically motivated only in the context of medial forms, it seems plausible to assume that this context has played a major role in the evolution of the light Imperfective suffix.

To sum up, the grammaticalization of the light Imperfective into the Relative Present seems to constitute an intrinsic component of the Imperfective-to-Progressive evolution in Tundra Yukaghir. This means that not only the Progressive-to-Imperfective developmental path is not unidirectional, but the reverse semantic change may occur as a result of further grammaticalization, rather than just as a side-effect of other developments in the same semantic domain.

6. Conclusion
The case of Yukaghir suggests that a universal diachronic theory of tense and aspect systems should account for bi-directional diachronic links between major

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5 The combination of events expressed by a chain can be marked as habitual only as a whole, by means of the Habitual marker on the finite verb.
cross-linguistic categories. In particular, it turns out that Dahl's (1985) original hypothesis of a bi-directional link between progressive and imperfective is supported by empirical evidence. A more general conclusion to be drawn from this case study is that grammaticalization can involve semantic specification, hence, the unidirectionality hypothesis for evolution of grammatical meanings must be rejected on empirical grounds.

The same empirical claim is made by Kuteva (1999) on the basis of other examples, namely, the development of a Present Perfect into a Hodiernal Past in Alicante Spanish (274-275), and the Counterfactual-to-Proximative development in Bulgarian (275-277). She suggests that, in order to account for such examples, a theory of grammaticalization should draw a stricter distinction between the "specific-to-general" and "concrete-to-abstract" dimensions of semantic change. The possibility of "backward" movement is attested only for the former dimension, which means that the unidirectionality hypothesis is empirically falsified only as far as the specific-to-general continuum is concerned.

This proposal appears particularly promising for the case discussed here. The Imperfective-to-Progressive development clearly involves semantic specification, since the semantic component "single event" must be added for a general Imperfective to evolve into a Progressive. On the other hand, the resulting meaning is arguably more abstract than the original one. In fact, the meaning of the Tundra Yukaghir Progressive amounts to two rather abstract semantic features, it signifies (i) a single-event situation which is (ii) simultaneous with the time of reference. In contrast with this, no references to an abstract "imperfective meaning" (e.g. in terms of "internal temporal structure") can suffice to describe the semantics of an imperfective marker in a given language. In particular, the only way to describe the semantics of the Kolyma Yukaghir Imperfective is to list the types of situations which can be encoded by means of this suffix. Although the meaning is more general, it is hardly reducible to a set of abstract semantic features. To put it differently, the semantics of the Kolyma Yukaghir Imperfective centers on the internal temporal structure of a situation, whereas the Tundra Yukaghir Progressive pertains to temporal relations between events. From this point of view, the Imperfective-to-Progressive development in Tundra Yukaghir resembles the more familiar processes of Aspect-to-Tense grammaticalization and can be accounted for as a shift from a more concrete to a more abstract semantic domain.

References

From Imperfective to Progressive


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Happening gradually

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In this paper I propose a semantics for gradually, a manner adverb. Gradually contrasts with suddenly, as aptly illustrated by the following example:

(1) At some point the economy will slow; the only question is whether this will happen gradually or suddenly. (WP, 21 Oct. 1999, p. A28)

I have three main reasons for studying gradually. First, as far as I am aware, there is no analysis of gradually in the literature. Second, although gradually is not generally considered to be sensitive to aspectual distinctions, it actually diagnoses a subclass of activities and accomplishments. Third and finally, the semantics of gradually brings together change and comparison.

1. Syntactic considerations
Gradually, like many adverbs, is not tied to a single position in a clause:

(2) a. Gradually(,) the ice melted. (initial)
    b. The ice gradually melted. (preverbal)
    c. The ice melted gradually. (postverbal)

Following Jackendoff (1972, chap. 3), I distinguish three basic surface positions in a clause for -ly adverbs: initial position, preverbal position (i.e., immediately before the main verb or an auxiliary verb), and postverbal position (i.e., after the main verb without an intervening pause).

* I am grateful to those who attended my talk for their comments and to Sebastian Löbner for useful discussion. Any errors are my own. With one exception, the naturally occurring examples are all taken from the Washington Post (WP). This work was supported by the German Science Foundation (SFB 282, Teilprojekt D3) and a fellowship from Collegium Budapest during the academic year 1997/98. This study has its origins in unpublished work of mine on German allmählich ‘gradually’.
Christopher Piñón

Table 1: Distribution of *gradually*

<table>
<thead>
<tr>
<th>Occurrences</th>
<th>79</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>5</td>
<td>6%</td>
</tr>
<tr>
<td>Preverbal</td>
<td>60</td>
<td>76%</td>
</tr>
<tr>
<td>Postverbal</td>
<td>14</td>
<td>18%</td>
</tr>
</tbody>
</table>

The paradigm exemplified in (2) raises three questions: (i) Is there a default position for *gradually*? (ii) Does the meaning of *gradually* vary according to position? (iii) What kind of syntactic unit does *gradually* combine with?

My answer to question (i) is based on a corpus of 79 naturally occurring sentences with *gradually* that I culled from the *Washington Post*. In this corpus *gradually* occupies preverbal position 76% of the time, postverbal position 18% of the time, and initial position a mere 6% of the time, as summarized in Table 1. Such a distribution strongly suggests that the preverbal position is the default position for *gradually*, a conclusion that also accords with one’s intuitions about the data.

In answer to question (ii) I adopt the strongest hypothesis that the lexical semantics of *gradually* is constant across positions. Even so, other factors can and do vary according to position, such as the scope of *gradually* and whether it is focused or not.

A case of scopal variation is the following:

(3) a. Gradually(,) every block of ice melted.
    b. Every block of ice gradually melted.
    c. Every block of ice melted gradually.

Whereas (3a) asserts that the melting of the set of blocks of ice was gradual, (3c) states that the melting of every individual block of ice was gradual. (3b) seems to allow for either interpretation.1

Evidence for a scopal ambiguity in (3) comes from the effect of inserting *suddenly* into postverbal position:

(4) a. Gradually(,) every block of ice melted suddenly.
    b. ?Every block of ice gradually melted suddenly.
    c. #Every block of ice melted gradually and suddenly.

It is possible to interpret (4a) as asserting that the melting of the set of blocks of ice was gradual but that the melting of each individual block of ice was sudden, which is imaginable if there were many small blocks of ice that melted one after another.

1 Jackendoff treats the preverbal position as structurally ambiguous, as dominated by the S node or the VP node. In his analysis, the initial position is dominated by the S node and the postverbal position by the VP node.
Happening gradually

(4c), in contrast, is contradictory, because the melting of each individual block of ice could not be both gradual and sudden. (4b) can receive either a consistent or a contradictory interpretation (though the consistent interpretation is much more naturally expressed by (4a)).

A natural way of focusing gradually is to place it in postverbal position. Indeed, in postverbal position it is hard not to pronounce gradually with a focus accent. This is evident in (1), where gradually is contrasted with suddenly. But it is clear in other examples as well:

(5) a. A baseball fan should be able to progress gradually toward rapture, or heartbreak. (WP, 22 Oct. 1999, p. D11)
   b. Kipke testified he became aware of the side effects only gradually. (WP, 13 Jan. 2000, p. D02)

The writer of (5a) complains that baseball games have become less enjoyable, with stadiums emptying early, and describes how a baseball fan should be able to progress toward rapture. The question to which (5b) is an answer is how soon Kipke knew about the harmful side effects of the drugs that he dispensed.

Sometimes it is more difficult to say why gradually appears in initial position (as opposed to preverbal position):

(6) a. Gradually, the Nigerians pushed the rebels out of Freetown. (WP, 9 Jan. 2000, p. W08)
   b. Gradually the practice [of using curse words] seeped onto TV through cable channels and then so-called pioneering dramas like NYPD Blue. […] (WP, 10 Jan. 2000, p. C04)

Although it would be easy to claim that gradually is ‘topicalized’ in such examples, it is far from obvious what this should amount to semantically or pragmatically. I suspect that the main motivation for placing gradually in initial position in these examples is to give it scope over tense. For example, (6a) seems to mean that it gradually came about that the Nigerians pushed the rebels out of Freetown. If correct, then a consequence of having gradually scope over tense is that gradually asserts gradualness not of the situation directly described by the clause but rather of what leads up to that situation.

A much clearer example of gradually scoping over tense is provided in (7), given that gradually is otherwise incompatible with stative descriptions, as we will see in the next section.

(7) Gradually there’s no more work for her. (I married a communist, Philip Roth, p. 309, Vintage Books, 1998.)
This example may be paraphrased as ‘Gradually it comes about that there’s no more work for her’.

In sum, although the placement of gradually is associated with semantic and pragmatic effects, I see no reason to reject the hypothesis that its lexical semantics remains constant no matter which position it appears in.

Turning at last to question (iii), since the preverbal position is the default position of gradually, I take this as indicating that gradually combines with a (subject-internal) VP:

(8) \[ {\text{VP gradually } [\text{VP}]} \]

More precisely, the syntactic unit that gradually subcategorizes for is a VP in which the (untensed) verb has combined with its arguments.

2. Interaction with aspect

In this section I examine the interplay of gradually with Vendler’s (1967) four aspectual classes. I presuppose familiarity with the use of for- and in-adverbials as tests for distinguishing states and activities from accomplishments and achievements. Although gradually is not usually taken to be an aspectual adverb, it is sensitive to a type of change characteristic of a subclass of activities and accomplishments.

A salient intuition about the meaning of gradually is that it requires some sort of change, for whatever happens gradually should in fact happen and not just hold. Since ordinary states are usually not thought to involve change, there is reason to expect that they will be incompatible with gradually, as is indeed the case:

(9) a. #Peter gradually loved Mary (in high school).
    b. #Mary gradually knew the answer (to the question).

It may be possible to interpret (9a) and (9b) as asserting that Peter gradually came to love Mary and that Mary gradually came to know the answer, respectively, but this would require reinterpreting the VP argument of gradually in each case so that it is no longer stative.²

States differ as to whether there is a scale of intensity along which they are realized. For example, although you can love someone a little or a lot, you cannot know the answer to a question a little or a lot. Applied to a state, the adverbial more and more asserts that the degree of intensity of the state steadily increases over time (compare (10) with the unacceptable #Mary knew the answer more and more):

²This reinterpretation might be accounted for by having gradually take scope over tense, as suggested in the previous section. Notice that Gradually, Peter loved Mary and Gradually, Mary knew the answer sound much better than (9a) and (9b) on the reinterpretation. Recall (7) as well.
Happening gradually

(10) Peter loved Mary more and more (as he grew older).

Once a state is so modified, \textit{gradually} is compatible with the result: \textsuperscript{3}

(11) Peter gradually loved Mary more and more (as he grew older).

Above I spoke of 'ordinary states' and by this I meant states as denoted by stative verbs. However, the progressive aspect is also often considered to be state-denoting, and it turns out \textit{gradually} is compatible with a variety of progressives:

(12) a. Moreover, the government feared that Hamas was gradually radicalizing Jordan's own broadly popular, and largely peaceable, Islamic movement. \textit{(WP, 7 Oct. 1999, p. A25)}

b. We never filed for bankruptcy protection and are gradually paying off all our creditors. \textit{(WP, 9 Oct. 1999, p. G19)}

This difference in behavior between ordinary states and 'progressive states' suggests that \textit{gradually} has narrow scope with respect to the progressive operator in progressives, i.e., \textit{gradually} first combines with a nonprogressive VP and then the progressive operator applies to the result. If this is the correct order of combination, then we predict that if \textit{gradually} is incompatible with a given nonprogressive VP, then it no acceptable progressive will be derivable. Such an example is offered in (13), where the unacceptability of (13b) with \textit{gradually} has the consequence that its progressive form in (13b) is also unacceptable, despite the acceptability of the progressive without \textit{gradually} in (13a).

(13) a. Mary was standing on the corner.

b. #Mary gradually stood on the corner.

c. #Mary was gradually standing on the corner.

Since \textit{activities} uncontroversially do involve change, they can be used to show that not any kind of change suffices for \textit{gradually}, because many activities, like ordinary states, are incompatible with \textit{gradually}:

(14) a. #Mary gradually ran (in the park).

b. #Peter gradually wrote letters (to his mother).

c. #I gradually drank wine (at the party).

The problem in (14) is not that there is no change, but rather that no scale of change is made explicit. If \textit{more and more} is employed once again to make the intended scale explicit, either as an adverbial (see (15a)) or as a determiner (see \textsuperscript{3}The result of modifying a state by \textit{more and more} is an activity.}
(15b) and (15c)), then the results are compatible with *gradually*:\(^4\)

(15) a. Mary gradually ran more and more quickly (towards the finish).
    b. Peter gradually wrote more and more letters (to his mother).
    c. I gradually drank more and more wine (at the party).

In (15a) *quickly* specifies the scale (quickness of motion) and *more and more* expresses that the quickness of Mary’s running steadily increased over time. In (15b) *more and more* states that the number of letters that Peter wrote steadily increased over time. (15c) is analogous.

Even so, not all activity verbs require modification by *more and more* in order to be compatible with *gradually:

(16) a. The economy gradually expanded (for three years).
    b. The sky gradually darkened (for two hours).

The question is what distinguishes the acceptability of *gradually* in (16) from its unacceptability in (14). I suggest that verbs like *expand* and *darken*, in contrast to those like *run*, *write*, and *drink*, have a scale of change built into their meaning. Although all of these verbs are activities, only *expand* and *darken* assert explicit change along a scale (namely, increase in extent and darkness, respectively). Other examples of verbs that pattern like *expand* are *rise*, *widen*, and *lengthen*, not to mention combinations of *become* with the comparative form of an adjective (e.g. *become smaller*).

*Gradually* occurs unproblematically with an array of *accomplishments*, as seen in (17). Such accomplishments all involve change along a scale, which intuitively accounts for their compatibility with *gradually*. In (17a) the scale is the extent of power, in (17b) it is the amount of sugar, and in (17c) it is the extent of destruction of the motor neurons.

(17) a. Only in the last few centuries, as their power gradually diminished to almost nothing, have British monarchs been able to sit securely on their thrones.  (*WP*, 13 Oct. 1999, p. H01)
    b. Gradually add the remaining 1/4 cup sugar and continue beating until the whites are glossy and firm.  (*WP*, 27 Oct. 1999, p. M34)
    c. Over the months, though, the disease, which gradually destroys the motor neurons that carry the brain’s messages throughout the body, has increasingly debilitated her.  (*WP*, 8 Jan. 2000, p. B03)

Nevertheless, not all accomplishments are equal in this respect. For example, the following sentences are questionable if taken to mean that the rescuing and

\(^4\) The result of modifying an activity by *more and more* is again an activity.
buying were gradual:

(18) a. The lifeguard gradually rescued Peter (at the beach).
   b. Mary gradually bought the house (in that street).

This becomes clearer if gradually appears in postverbal position:

(19) a. The lifeguard rescued Peter gradually (at the beach).
   b. Mary bought the house gradually (in that street).

The examples in (18) can be understood as asserting that what led up to the lifeguard’s rescuing of Peter and Mary’s buying of the house was gradual, but this again requires reinterpretting the VP so that what gradually appears to modify semantically (the type of events denoted by the VP) is not what it actually modifies (the type of events leading up to the events denoted by the VP).5

The problem with (18) is not that there is any inherent incompatibility between gradually and rescue or buy. Indeed, if we replace the object NPs in (18) with plural definite NPs, the results are compatible with gradually:

(20) a. The lifeguard gradually rescued the children (at the beach).
   b. Mary gradually bought the houses (in that street).

The difference between (18a) and (20a) is that if the lifeguard rescues Peter, she rescues him as whole and not part by part, but if she rescues the children, she may well rescue them one after the other, which is what gradually requires. The same difference holds between (18b) and (20b).

Although gradually appears at first glance to be compatible with achievements, it actually forces an achievement to be reinterpretated as an accomplishment, similar to what we saw with states and accomplishments (recall (9) and (18), respectively), though the reinterpretation of achievements is much more natural and nearly automatic:

(21) a. The speaker only gradually realizes what the weather is telling her: “as I looked (for things did not look) up.” (WP, 10 Oct. 1999, p. X12)
   b. Mary gradually noticed the new student in her class.
   c. Peter gradually reached the summit.

The relevant parts of (21a) and (21b) can be paraphrased as ‘gradually comes to realize’ and ‘gradually came to notice’, respectively, and (21c) has the approximate paraphrase ‘gradually succeeded in reaching’.

In sum, gradually diagnoses a subclass of activities and accomplishments. This

5 Recall the discussion of (9), where states allowed for a similar reinterpretation. See also footnote 2.
statement requires a caveat: in general it is possible for gradually to modify what leads up to the situation described by the VP. This reinterpretation works most naturally with achievements, but it is also possible with states, activities, and accomplishments and is most inviting when gradually appears in initial position, where gradually arguably scopes over tense.

3. Analysis: events and degrees
For the analysis of gradually below I presuppose a domain of interpretation that includes the following basic sorts and relations:

- a sort of (physical) objects: x, y, z, …
- a sort of events (in the broad sense, including states): e, e’, e”,…
- a sort of degrees: d, d’, d”,…
- a proper part relation on objects and events: ⊆
- a temporal precedence relation on events: <
- a less-than relation on degrees: <

The definitions of the (improper) part relation (on objects and events) and the less-than-or-equal relation (on degrees) are stated with the help of identity in the usual way, as in (22), where v, v’, v”,… are variables for objects or events.

(22) a. \( v \subseteq v' \equiv v \subseteq v' \land v = v' \) (v is a part of v’)

b. \( d \leq d' \equiv d < d' \lor d = d' \) (d is less or equal to d’)

I also define both an initial proper part and an initial part relation on events:

(23) a. \( e \sqsubseteq_{ini} e' \equiv e \subseteq e' \land \exists e''[e'' \subseteq e' \land e'' < e] \land \forall e_1 \forall e_2[e_1 \subseteq e \land e_2 \subseteq e \rightarrow \neg \exists e''[e'' \subseteq e' \land e_1 < e'' \land e'' < e_2 \land \neg e'' \subseteq e]] \)

(e is an initial proper part of e’)

b. \( e \sqsubseteq_{ini} e' \equiv e \sqsubseteq_{ini} e' \lor e = e' \) (e is an initial part of e’)

The condition beginning with the universal quantification on the first line of (23a) is needed because no assumption is made regarding the connectedness of events. Informally, this definition ensures that if e’ is an initial proper part of e, then e’ cannot temporally ‘skip over’ any parts e” of e.

Although I postulate a domain of degrees, I have not said anything about what degrees are. For the purpose of analyzing gradually it suffices to think of degrees as (positive) intervals on a scale, where a scale is an ordered set of points along some dimension (see Hay, Kennedy, and Levin 1999 for discussion). For example, if the dimension is extent of destruction, then degrees (qua positive intervals) on the associated scale can model the extent to which an object is destroyed.
Happening gradually

My analysis of *gradually* is given in (24), where *gradually* is treated as a modifier of relations $R$ between events $e$ and degrees $d$ and asserts that as $e$ unfolds, the degree of $e$ as determined by $R$ steadily increases.\(^6\) Technically, this is implemented by mapping the set of initial parts of $e$ into a set of degrees determined by $R$ so that the ordering on initial parts is preserved in the ordering on degrees. To ensure that the mapping is nonvacuous, it is required that $e$ have an initial proper part.\(^7\)

\[
\text{(24)} \quad \text{gradually} \sim \lambda R \lambda d \lambda e[R(e, d) \land \forall e' \forall e''[e' \sqsubset_{ini} e'' \land e'' \sqsubset_{ini} e \rightarrow \\
\exists d' \exists d''[R(e', d') \land R(e'', d'') \land d' < d'' \land d'' \leq d]] \land \exists e'[e' \sqsubset_{ini} e] \\
\overset{\text{def}}{=} \text{Gradual}
\]

I adopt a standard assumption of event-based semantic approaches that verbs have an event argument (e.g., see Krifka 1992). Since *gradually* needs a relation between events and degrees to apply to, the main task is to account for how a degree argument comes into play in the course of semantic composition. In general, there are three ways in which this can happen.

The first way is for verbs to have a degree argument to begin with. Such verbs are presumably the exception rather than the rule, but ‘degree achievements’ are good candidates, as argued for on independent grounds by Hay et al. (1999). Additional support for this idea comes from the observation that degree achievements combine very well with *gradually*. Consider, for example, the analysis of (16a) with the degree achievement *expand*:

\[
\text{(25)} \quad \begin{align*}
\text{a.} \quad \text{expand} & \sim \lambda x \lambda d \lambda e[\text{Expand}(e, d, x)] \\
\text{b.} \quad \text{the economy expand} & \sim \lambda d \lambda e[\text{Expand}(e, d, \text{The-economy})] \\
\text{c.} \quad \text{the economy gradually expand} & \sim \\
& \lambda d \lambda e[\text{Gradual}(e, d, \lambda d' \lambda e'[\text{Expand}(e', d', \text{The-economy})])] \\
\end{align*}
\]

As shown in (25a), *expand* is treated as a three-place relation between events, degrees, and objects, and can be paraphrased as ‘object $x$ expands in event $e$ to degree $d$’. The formula in (25c) asserts that the degree to which the economy expands steadily increases as the event unfolds. Other verbs that pattern like *expand* (see the discussion of (16)) would also be analysed as having a degree argument.

The second way is for a degree argument to be introduced by a modifier, most notably *more and more*. This is the way for stative and most activity verbs to become compatible with *gradually* (see (9), (11), (14), and (15)). Consider, for instance, the analysis of (15a) with *run*:

\[^6\] *Merriam Webster’s Collegiate Dictionary* characterizes the meaning of *gradually* (and *gradual*) as ‘proceeding by steps or degrees’ and ‘moving, changing, or developing by fine or often imperceptible degrees’.

\[^7\] Perhaps the semantics of *gradually* also existentially quantifies over the degrees $d$ in (24) (instead of relying on default existential quantification at a later point), but I do not try to decide this here.
(26) a. \( \text{run} \sim \lambda x \lambda e[\text{Run}(e, x)] \)

b. \( \text{Mary run} \sim \lambda e[\text{Run}(e, \text{Mary})] \)

c. more and more quickly \( \sim \lambda P \lambda d \lambda e[P(e) \land \text{Quick}(e, d) \land \forall e'\forall e''[e' \sqsubseteq_{\text{ini}} e'' \land e'' \sqsubseteq_{\text{ini}} e \rightarrow \exists d' \exists d''[P(e') \land \text{Quick}(e', d') \land P(e'') \land \text{Quick}(e'', d'') \land d' < d'' \land d'' \leq d]] \land \exists e'[e' \sqsubseteq_{\text{ini}} e]] \)

\( \stackrel{\text{def}}{=} \) More-more-quick

d. \( \text{Mary run more and more quickly} \sim \lambda d \lambda e[\text{More-more-quick}(e, d, \lambda e'[\text{Run}(e', \text{Mary})])] \)

e. \( \text{Mary gradually run more and more quickly} \sim \lambda d \lambda e[\text{Gradual}(e, d, \lambda d' \lambda e'[\text{More-more-quick}(e', d', \lambda e''[\text{Run}(e'', \text{Mary})])])] \)

Since the analysis of \([_{\text{vp}}\text{Mary run}]\) in (26b) does not involve a degree argument, it is incompatible with \textit{gradually}, as seen in (14a). However, the situation is remedied by the adverbial \textit{more and more quickly}, which adds the necessary degree argument. The semantics of \textit{more and more quickly} in (26c) makes use of a relation \text{Quick} between events and degrees (intuitively, ‘event \( e \) is quick to degree \( d \)’). Notice that the meaning of \textit{more and more quickly} is very similar to that of \textit{gradually}, though with two notable differences.\(^8\) The first is that \textit{more and more quickly} specifies the scale of change (quickness of motion), whereas \textit{gradually} leaves this to the relation \( R \) that it applies to. The second difference is that \textit{more and more quickly} extends a predicate of events to a relation between events and degrees, whereas \textit{gradually} requires such a relation to begin with.

Finally, the third way is for a degree argument to be introduced by a \textit{degree function}. The idea behind a degree function is that it maps events, objects, and relations between events and objects into degrees such that the degrees directly reflect how an object ‘measures out’ an event with respect to the relation in question. A degree function has the applicability condition defined in (27a) and satisfies the principle of extendability to proper parts given in (27b).

(27) Let \( \delta \) be a function from (triples of) events \( e \), objects \( x \), and relations \( R \) between events and objects to degrees \( d \). \( \delta \) is a degree function iff

a. \( R(e, x) \land \forall x'[R(e, x') \rightarrow x' = x] \land \forall e'[e' \sqsubseteq_{\text{ini}} e \rightarrow \exists x'[x' \sqsubseteq x \land R(e', x')]] \leftrightarrow \exists d[\delta(e, x, R) = d] \)

(\text{Applicability condition for} \( \delta \))

\(^8\) The formula in (26d) asserts that as the event in which Mary runs unfolds, its degree of quickness steadily increases. The analysis of \textit{more and more quickly} in (26c) is too strong as it stands (in particular, the increase in quickness should be more ‘coarse-grained’ than stated), but I set this complication aside here. In a more detailed account it would be important to guarantee that \textit{Mary gradually ran more and more quickly} entails \textit{Mary ran more and more quickly} but not vice versa. As things stand, the two sentences are mutually entailing.
b. \[ \delta(e, x, R) = d \rightarrow \exists e'[\delta(e', x', R) \land d' \land d' < d] \]
(\(\delta\) extends to proper parts)

The effect of the applicability condition in (27a) is that \(\delta\) returns a value just in case object \(x\) uniquely and incrementally reflects the development of event \(e\) with respect to relation \(R\). The principle in (27b) states that if \(\delta\) applies to event \(e\), object \(x\), and relation \(R\), then it returns a smaller value for any initial proper part of \(e\) and proper part of \(x\) that \(R\) holds of.

Verbs that lack a degree argument can acquire one with the help of a degree function provided that they denote relations satisfying the condition in (27a). In general, this is what happens with accomplishments in order to combine with gradually (see (17) and (20)). Consider, for example, the derivation of (the relevant part of) (17c) with \textit{destroy}:\(^9\)

\[
\begin{align*}
(28) & \quad \text{a. } \text{destroy } \sim \lambda y \lambda x \lambda e [\text{Destroy}(e, x, y)] \\
& \quad \text{b. } \delta \sim \lambda R \lambda y \lambda x \lambda d \lambda e [\delta(e, y, \lambda y' \lambda e'[[R(e', x, y')])] = d] \\
& \quad \text{c. } \text{destroy}^\delta \sim \lambda y \lambda x \lambda d \lambda e [\delta(e, y, \lambda y' \lambda e'[[\text{Destroy}(e', x, y')])] = d] \\
& \quad \text{d. } \text{the disease destroy}^\delta \text{ the motor neurons } \sim \\
& \quad \quad \lambda d \lambda e [\delta(e, \text{The-motor-neurons}, \\
& \quad \quad \quad \lambda y' \lambda e'[[\text{Destroy}(e', \text{The-disease}, y')])] = d] \\
& \quad \text{e. } \text{the disease gradually destroy}^\delta \text{ the motor neurons } \sim \\
& \quad \quad \lambda d \lambda e [\text{Gradual}(e, d, \lambda d' \lambda e'[[\delta(e', \text{The-motor-neurons}, \\
& \quad \quad \quad \lambda y' \lambda e'[[\text{Destroy}(e'', \text{The-disease}, y')])] = d')] ]
\end{align*}
\]

While it is clear that \(\delta\) is applicable to any suitable relation between events and objects, it might also seem that \(\delta\) overapplies. Take, for example, \textit{eat}: \(\delta\) should apply to \textit{eat} in (29a) but not in either (29b) or (29c), and yet the internal argument relation of \textit{eat} has the same properties in all three cases. In other words, if \(\delta\) applies to \textit{eat}, then what prevents \textit{eat} from combining with a bare singular or plural object NP or with no object NP at all? Since many verbs pattern like \textit{eat} in this respect (e.g. \textit{write} and \textit{drink}—see (14a) and (14b)), the analysis with \(\delta\) is in danger of overgenerating.

(29) a. I gradually ate a big slice of cheesecake (at the party).

b. #I gradually ate (at the party).

c. #I gradually ate cheese (at the party).

\(^9\) The simplest representation of \(\delta\) is \(\lambda R \lambda y \lambda d \lambda e [\delta(e, y, R) = d]\), which is applicable to intransitive verbs. The formula given in (28b) is a type-shifted variant of this, applicable to transitive verbs (e.g. \textit{destroy} in (28a)).
A quick solution to this problem lies in differentiating related versions of *eat* at the lexical level by making the internal argument relation of *eat* available in (29a) but unavailable in (29b) and (29c). More precisely, whereas *eat* as a bona fide transitive verb is analyzed as in (30a), the intransitive version of *eat* is represented as in (30b), and the ‘incorporating’ version of *eat* is translated as in (30c).\(^{10}\)

\[(30)\]

\[\begin{align*}
  \text{a. } & \text{eat}_{\text{trans}} \rightarrow \lambda y \lambda x \lambda e [\text{Eat}(e, x, y)] \\
  \text{b. } & \text{eat}_{\text{intrans}} \rightarrow \lambda x \lambda e [\exists y [\text{Eat}(e, x, y)]] \\
  \text{c. } & \text{eat}_{\text{incorp}} \rightarrow \lambda P \lambda x \lambda e [\exists y [\text{Eat}(e, x, y) \land P(y)]]
\end{align*}\]

Of these analyses of *eat*, it is clear that δ is applicable only to the first, because the internal argument is existentially quantified in the latter two. But if δ is not applicable to the intransitive and ‘incorporating’ versions of *eat*, then there is no way to derive the sentences in (29b) and (29c). Other contrasts of this sort would be treated similarly.\(^{11}\)

References


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\(^{10}\) The incorporation analysis presupposes a treatment of bare singular and plural NPs as one-place predicates and has been argued for independently by van Geenhoven (1998).

\(^{11}\) Manfred Krifka suggested to me that the incorporation analysis might be relevant in ruling out examples such as (29c).
Aspect and Grammaticalization in Guyanese Creole*

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0. Introduction
The purpose of the following is to provide a principled description of aspect marking in contemporary Guyanese English Creole (GC) which can be used, in combination with records of speech from earlier periods, to shed light on the problem of creole formation. The analysis raises several theoretical issues. The most central of these is the status of the stem form of the verb and its relation to the marked options. I will argue that bare verb stems should not be characterized as "marked with ∅" as Bickerton (1975:46) suggests since this necessarily implies that ∅ instantiates a specific tense or aspect category with basic semantic content. Perfective-like meanings associated with the stem form of the verb are rather conversational implicatures derived from the interaction of several levels of discourse and semantic structure. The evidence reviewed here further suggests that aspectual distinctions emerged gradually in GC rather than abruptly as Bickerton (1981) claims.

1. A framework for the description of aspect
In the following, I draw on Chung and Timberlake's (1985) framework for the description of aspect but have introduced a number of modifications both substantive and terminological. As suggested in Table 1, if we define aspect in most general terms as "different ways of viewing the internal temporal constituency of a situation" (Comrie 1976:3) or as "the relationship of a predicate to the time interval over which it occurs" (Chung and Timberlake 1985:213), we can distinguish (minimally) five levels of discourse and semantic structure which

* For financial support of the research on which the present paper is based I thank the Wenner-Gren Foundation for Anthropological Research and the Social Sciences and Humanities Research Council of Canada. I'd especially like to thank John McWhorter, Bettina Migge and Salikoko Mufwene for their very helpful comments on an earlier version of this paper.

contribute to the aspectual value attributed to an event, situation or action in discourse.

Table 1. Levels of semantic and discourse structure relevant to aspect

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>MANIFESTED AS...</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexical</td>
<td>Verb and verbal particles,</td>
<td>angry</td>
</tr>
<tr>
<td></td>
<td>Other lexical categories</td>
<td>eat-up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hit</td>
</tr>
<tr>
<td>Grammatical</td>
<td>Grammatical categories</td>
<td>is eating</td>
</tr>
<tr>
<td></td>
<td>(e.g. English progressive)</td>
<td></td>
</tr>
<tr>
<td>Argument</td>
<td>Verb+grammatical markers +</td>
<td>John ate Ø</td>
</tr>
<tr>
<td></td>
<td>core arguments</td>
<td>John ate an apple.</td>
</tr>
<tr>
<td>Clausal</td>
<td>Adverbials and clausal</td>
<td>John ate an apple everyday.</td>
</tr>
<tr>
<td></td>
<td>operators (e.g. if, when,</td>
<td>Whenever John ate an apple...</td>
</tr>
<tr>
<td></td>
<td>whenever...)</td>
<td></td>
</tr>
<tr>
<td>Discourse</td>
<td>Event sequencing</td>
<td>John ate then drank a beer.</td>
</tr>
</tbody>
</table>

Although, the semantic contribution of, for example, the imperfective marker is stable and regular, the interpretation of a particular event in terms of its aspectual character, in discourse, will always depend upon an interaction between two or more levels of semantic structure (e.g., lexical and grammatical). In the following, I will examine the use of the unmarked verb and the imperfective marker in discourse paying particular attention not only to grammaticalized categories but also to lexical, argument, clausal and discourse levels of meaning.

2. The verb stem
Examples 1-4 illustrate the use of the stem form of the verb in GC.

(1) *foor yürz ii Ø get*
    “He is four years old.”
(2) *mi Ø lef a leedii piknii a Aisha.*
    “I left the woman’s children and Isha’s.”
(3) *dem na Ø lak op B? dem Ø kech am wee?*
    “Didn’t they lock up B? Where did they catch him?”
(4) *i Ø tel mi. i Ø tel mi dis marrin se hou i gu tel Beebii bikoz Mis Ø see na wen di piipol dem Ø gu ainee. Mis Ø see da shi na laik di gyal.*
    “He told me. He told me this morning how he will tell Baby because Miss said “No.” when the people went away. Miss said that she doesn’t like the girl.”

As Bickerton (1975:28) notes “the stem form exceeds in frequency any of the marked forms.” He attributes this to two factors: the multifunctionality of the
stem form and the operation of a series of deletion rules. Although Bickerton recognizes both the ubiquity of the unmarked verb and the range of functions it serves, he nevertheless maintains that it instantiates one pole of a privative opposition (sensitive to the stativity of the predicate). According to Bickerton, with non-statics, the stem form signifies 'unmarked past.' With stative verbs the stem form signifies non-past. In later work (1981:28) Bickerton writes of a non-punctual category (i.e. imperfective) semantically opposed to a punctual category expressing single, non-durative actions or events. For Bickerton (1980) punctual and non-punctual (perfective and imperfective) are "semantic primes", one aspect of a "natural semantax". The stem form of the verb is understood as "marked with zero" - in Jakobson's (1984 [1938]) terms it is a "zero sign". Within Bickerton's theory of creole genesis, the punctual/non-punctual distinction is claimed to be a reflex of the "language bioprogram" triggered in children, who, faced with inadequate and disorderly pidgin input, create a creole in the process of first language acquisition (for varied criticism of this theory see for example Goodman 1985; Singler 1986)

In her critique of Bickerton's arguments, Sankoff (1990) offers an alternative account in which verbs occurring with no marker are "not marked with zero" but rather constitute the "historical residue of an earlier stage of the language" in which the tense and aspect morphology of the superstrate language had not been transmitted and the creole markers had not yet evolved.

...in creole languages it is much more common to find not privative oppositions but facultative and optional ones. The reason for this seems relatively straightforward. The evolution of privative oppositions can only take place via processes of grammaticalization whereby morphemes that come to mark such oppositions only acquire their compulsory and redundant character over a long period of use as meaningful options. (Sankoff 1990:297)

In a similar vein, Bybee (1994) notes that the grammaticalization of zero depends on the concurrent grammaticalization of some overt morpheme as obligatory. When a gram becomes obligatory for the expression of some meaning, its absence takes on a specific meaning - it conveys the absence of that semantic feature which the now obligatory morpheme has come to specify. Bybee contrasts such "zero meanings" (instantiated by the absence of an obligatory morpheme, e.g. singular in English nominal morphology) with what she calls "open meanings" which are associated with the absence of an optional grammatical morpheme. (Here she usefully contrasts English present progressive which is obligatory in the expression of "event in progress" with the gram useto which is optional in the expression of past habitual, so it is possible to convey past habituality by use of the preterit form - e.g., Everyday I ate an apple and walked to work.) The question then is whether the stem form of the verb in GC instantiates some unique, specifiable meaning, or on the contrary, is simply unspecified for any
aspectual parameter. The weight of evidence suggests that, in fact, the stem form is not "marked with Ø" and does not instantiate a specific semantic category. Common perfective-like meanings arise in particular contexts as conversational implicatures derived from an interaction of several levels of semantic and discourse structure.

For example, in narrative discourse, the stem form is used to convey the backbone of foregrounded action. Background, incidental and otherwise framing action is usually conveyed by the use of the imperfective marker.

(5) Neks marnin wen Shoobai dem Ø gu dongtong dem Ø riich op wid Ma an den dem Ø tel Ma dat hou dee Ø fain Roohan get di jewol an abii Ø hool-op ii an Ø lak am op wid Ramaloo an soo an den abi Ø sen mesaj wid Fat Bai fu tel Talii

"Next morning, when Show-boy and them went downtown, they met-up with Ma and then they told Ma that they found Rohan had the jewel and we caught him and locked him up with Ramalo and so on and then we sent a message with Fat Boy to tell Tali."

Dynamic unmarked verbs such as gu 'go', riich-op 'meet-up', tel 'tell' are used here to refer to events which fit closely Dahl's description of perfective (1985:78): "A perfective verb will typically denote a single event, seen as an unanalyzed whole, with a well defined result or end-state, located in the past." However, the perfective-like meaning of punctual verbs in this example does not follow immediately from the unmarked form of the verb. Rather this interpretation depends on the contribution of both the inherent aspectual value of the verb and a variety of discourse factors. For instance, the speaker uses explicit sequencing connectives such as den 'then' to indicate closure of the actions referred to by gu and riich-op. Note also that the verb riich is also used in GC without the bounder particle op, here riich-op is used to increase the telicity of the verb. "Bounded event" or "simple past" is thus the default interpretation of the unmarked telic verb in this context of a clear series of sequenced events.

Derived and discourse dependent meanings tend to be defeasible whereas fully grammaticalized meanings are not. It is therefore important to note that, in other discourse contexts, the stem form of the dynamic verb conveys non-perfective meanings. For instance, in proverbs and related genres the unmarked verb is used to convey generic meaning.²

(6) Dag wa Ø bark plenti, Ø ron wen taim kom fu fait

"A dog that barks a lot, runs when its time to fight."

² There is significant variation in proverbs. In some cases generic meaning is conveyed by the use of the imperfective marker.
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(7)  *Wan wan dotii Ø bil dam.*
     "Successive pieces of dirt build a dam - i.e. Every little bit adds up."

The stem form is also used in clearly habitual contexts. Once a habitual interpretation is established for a series of events, subsequent predicates may occur without preverbal marking. Example (8) (from Jaganaauth 1994) illustrates this.

(8)  *Wel mi heer, lang taim, dat de das kot rais wid haan...wid graas naif. Den... den.. am.. wen dem kot dis rais wid graas naif. dem Ø biit am out. dem Ø biit out a rais wid aam...ageens...pan wan am...pan wan poos...Den wen dem biit am out pan wan poos, dem Ø ful kopl kyerasin kyan den dem Ø spred am pan aam dem Ø spred am pan bag*
     "Well. I hear, long ago that they usually cut rice by hand with grass knives. Then when they cut this rice with the grass knife they beat it out They beat out the rice with against.. on a post Then when they beat it out on a post they fill a couple kerosene cans, then they spread it on they spread it on bags."

The passage illustrates the use of the stem form of the verb to convey habitual meaning. The importance of sequencing should not be underestimated. Thus note the way the temporal adverbial *laang taim* 'long ago' is used in the first clause to establish past time reference, while *doz* (realized as *das*) establishes the sense of habituality. Subsequent clauses introduced with *den* 'then' are understood as carrying the same values for tense and aspect. Clearly no one level of semantic or discourse structure is alone responsible for the aspecual value of a given predicate in discourse. It is useful in this respect to compare example 8 with example (5). In both we find a sequence of unmarked dynamic verbs. In one, however, the interpretation is habitual whereas in the other it is perfective-like. The marking of the first verb in the series is clearly crucial to the interpretation of the following ones.

A final use of the stem form of the verb, both stative and non-stative, is in conditional and temporal clauses. Because he sees the unmarked verb as instantiating a specific tense-aspect category (essentially perfective, his "punctual"), Bickerton attributes its occurrence here to the operation of the "main stative rule" which deletes (or non-generates) imperfective *a* in this context (see Mufwene 1984). However, if we see the stem form as simply unanalyzed for tense and aspect it is not necessary to postulate any deletion rules to account for its use in this context. It is, in fact, the neutral temporal character of the stem which allows it to take on the semantics of the clause-level operator (*if, when*) as in examples (9) and (10).
(9)  *wen shi Ø suun sii shii swala enii blak shi Ø spit it out.*
    "When she sees that she has swallowed any black thing she spits it out."

(10) *if dem Ø relii ignoor mii, mi Ø biit dem.*
    "If they ignore me, then I beat them."

To summarize, the unmarked verb is best understood as unanalyzed for parameters of tense and aspect. It is this absence of specific semantic content which allows the stem form to occur in a broad range of contexts, to carry a variety of semantic interpretations and to serve a number of discourse functions. Its primary use is to refer to simple past events or present states. Secondary uses include reference to past states, open conditionals, habitual events, and generic situations. This range of meaning and function can be understood as an effect of the interaction between different levels of discourse and semantic structure. In narrative, in particular, sequenced events are most often referred to using the stem form of the verb and clause-level semantics of closure emerge as conversational implicatures in this context. Alternatively, where the habitual nature of the events is established in the opening of a narrative sequence, subsequent habitual events are often conveyed by the use of the stem form.

3. Imperfective and habitual

Crosslinguistically, imperfective markers present an event as unbounded or as containing some "explicit reference to the internal temporal structure of a situation" (Comrie 1976:24). An imperfective situation is viewed either as in progress (progressive) or as characteristic of a period of time that includes the reference time (habitual). Examples in (11-14) illustrate the use of the imperfective preverbal particle *a* in past (13) and non-past contexts, with stative (12) and non-stative predicates, to express habitual (11, 12) and progressive (13, 14) meanings:

(11) *Safii a jraiiv kyar wid oman hool dee.*
    "Safi drives around with women all day."

(12) *Di man dem a de moor in sosaiitii.*
    "The men tend to be more in the public sphere."

(13) *Shi a pik plom, wen mi aks shi yestodee.*
    "She was picking plums when I asked her yesterday."

(14) *Hiir, Linda a kal yu.*
    "Hear, Linda is calling you."

Speakers of GC alternately convey habituality by the use of the preverbal marker *doz* (this variation is discussed in Rickford 1986; Sidnell frth.). Examples (15) and (16) illustrate this use of *doz.*

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(15) *i doz kyerii meed gu wid am tuu
   “He takes his maid along with him aswell.”
(16) da taim abii-diiz doz go a skuul
   “At that time, we used to go to school.”

The imperfective particle and habitual marker interact with the inherent aspectual value of the verb in regular and predictable ways. Although Bickerton (1975:31) claimed that the imperfective marker could not combine with stative predicates, subsequent research by Gibson (1988), Rickford (1987) and Winford (1993), among others, has shown this to be mistaken. We can therefore compare Bickerton’s starred example 2.8 (given here as 17) with attested examples such as (18) and (19).

(17) *dem a gat wan kyar (Bickerton’s 2.8, page 30)
   “They are having [sc. possessing] a car.”
(18) *dem a gat aal mi kotlas de
   “They always have all my cutlasses there.”
(19) jos laik da dem man a waan fai bai
   “The slightest thing and those guys (habitually) want to fight.”

The combination of imperfective with stative predicates almost categorically results in either distributive (18) or habitual (19) meaning. The distributive interpretation is an effect of the interaction between predicate stativity, grammaticalized category and plural number marking of either subject or object argument. Compare (18) where it is the plural object which effects distributive meaning with (20) where the subject has a similar function.

(20) aal dem baigan a ge siid nou
   “All the eggplants have seeds at this time of year.”

In narrative sequences imperfectively marked verbs and stem forms tend to occur in complementary distribution. Whereas, as we saw in example (5), the stem form tends to carry the backbone of narrative action, the imperfective marker is associated with backgrounded, framing or otherwise incidental events and actions — those events which are either NOT clearly sequenced or are incidental to the main line of narrative action.

(21) wel oroun sevon oklak, rait? wan abi fren Ø kom an tel abii dat hou
de Ø hiir Jan de bai DT rait? l’abii gu bring wan poliiis an chek in di
hous sii i onda bed haidop. wel seem taim m’a gu out mi Ø miit ongkl
M. an mi Ø tel ongkl M. if ii kyan kom dong a bak hiia gi wan wach fo
mii
“Well around seven o’clock, right? One of our friends came and told us that they had heard that John was over at DT’s house, right? She suggested that we go and get the police and check in the house to see if he was hidden under the bed. Well at the same time, I was going out – I met Uncle M. and I asked Uncle M. if he could come down to the back here and take a look for me.”

The excerpt illustrates one typical function of the imperfective marker in narrative sequences – that of showing simultaneity (a break in sequence). Such simultaneous events are typically backgounded in that they set the stage for some development in the main line of narrative action.

To summarize, the basic meaning of the imperfective particle in GC is “unbounded event or situation”. In this capacity it is used primarily to refer to habitual or progressive situations. It also has a number of secondary uses including reference to future events.

4. Conclusions
The preceding analysis suggests that Ø is only partially grammaticalized in GC. The imperfective marker is obligatory for the expression of “event in progress” (progressive) but not for habitual. Thus we have seen that stem forms can convey habituality in the right discourse context. A variety of evidence suggests that imperfective in Guyanese Creole developed along a path from locative (Jan de a gyadin, “John is in the garden”), to progressive (Jan (d)a wok, “John is at work/is working”), to imperfective (Jan a wok, “John works”) (see Pochard & Devonish 1986). While it is not possible to present all the diachronic evidence here I will give a brief summary. Guyana experienced British colonization relatively late in comparison with other territories. Our earliest records of speech come from the very late 18th and early 19th centuries (about 60 years after the beginnings of English settlement in the territory). As Rickford (1991:311) notes, imperfective (continuative) de or (d)a is not found in any of the early-nineteenth-century texts. In contrast, both future/irrealis sall (e.g., “if I sall do dat, me go to hell.” Pinckard 1806 vol. 2:170) and past been (e.g., “me been see that white man in me country.” Bolingbroke 1807: 105) are attested (both examples are cited in Rickford 1987). Furthermore, in these texts we find the stem form of the verb used in both habitual and progressive contexts. Pinckard’s (1806 vol. 2:60) Sable Doctor uses the stem form to convey habituality.

(22) It always so, Massa, at this time o’ year, because him weather Ø change from wet to dry.

St. Clair (1834 vol. 1:129, cited in Rickford 1987), speaking of an incident in which a slave points at a group of “baboons” during a hunt, provides an example of the stem form used to express “event in progress”.
Aspect and Grammaticalization in Guyanese Creole

(23)  Heree! Heree, Massa! Heree him Ø run!

The first attestations of progressive/imperfective (d)a come from middle of the 19th century. Barton Premium (1850) provides the following examples:

(24)  Hey! Quaco, you da go dance in a field (p. 74)
(25)  tha' nyung mangea no ha' sense, he da play h-l yander (p. 106)

In (24) the da is used in combination with go to express "event in progress" (i.e. "going" - it is important to note that the (d)a+go construction here conveys real movement, i.e. it does not express future intention as it can in contemporary GC, e.g., ii a go fain di badi wa tek am. "He is on his way to find the person who took it" or "He will find the person who took it."). In (25), da is ambiguous between progressive and habitual readings (i.e. "He is raising/raises hell over there."). The argument that progressive uses arose through an extension of locative meanings is supported by the fact that in these first examples a locative interpretation is still available (e.g., "There you go to dance in the field"). The earliest examples we have of da being used to express aspeclual meaning are thus found in precisely those contexts which would have allowed for reanalysis from locative to progressive (see Hopper & Traugott 1993). Further support for the grammaticalization argument comes from the fact that it is in just these same texts that we find the first attestations of the locative copula de from Guyana.

(26)  me no de a field Torsday. (Premium 1850: 219)

By the late nineteenth century, in the texts of McTurk, Kirke and Crookall, (d)a is used consistently in expressions of "event in progress" and variably in expressions of habituality. It thus seems clear that the process of grammaticalization by which (d)a came to express progressive meaning was a gradual rather than abrupt one reflecting recurrent patterns of discourse level patterning and collocation. While perhaps ultimately shaped by cognitive factors, such processes do not depend on the operation of a language bioprogram triggered by the nativization of an earlier pidgin. Rather than emerging spontaneously in a creole created by children, imperfective markers appear to have developed through a gradual processes of grammaticalization along a path well-attested in cross-linguistic studies (see Bybee et. al. 1994). An original locative expression (itself formed by the use of a reconstituted locative copula de, source: English there) came to be used in expressions of "event in progress". This progressive marker was then extended to cover habitual situations and events (a path found to be common across a large sample of languages by Bybee and Dahl 1989:82) thus becoming an imperfective marker. The evidence I have reviewed here, which shows that habitual situations can be conveyed by the use of the stem form of the verb, indicates that in GC this
process of grammaticalization is not complete. This synchronic indeterminacy and diachronic path is quite incompatible with Bickerton's language bioprogram hypothesis and other approaches to creole genesis which propose that these languages arose abruptly through a process of nativization. The GC materials highlight the fact that some features of a language, creole or otherwise, emerge gradually over time as lexical items (or phrases) take on grammatical functions, become fixed in their syntactic distribution, reduced in phonological substance and obligatory for the expression of a particular meaning. This last stage, correlates with the full grammaticalization of zero. It is reasonable to assume that, being relatively young languages, many creoles will primarily convey "optional" rather than "zero" meanings through the use of unmarked forms (Bybee 1994; Sankoff 1990).

References

Aspect and Grammaticalization in Guyanese Creole


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Between Perfective and Past: Preterits in Turkic and Nakh-Daghestanian

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1. Perfective, past, and habitual: the Bybee and Dahl approach
A broad typological study reported in Bybee et al. 1994 has established various universal restrictions on the diachronic development of tense-mood-aspect (TMA) categories and on their synchronic distribution. Approach adopted in this study (following Dahl 1999:3, I refer to it as to the «Bybee and Dahl approach») is mostly based on earlier B.Comrie, J.Bybee and Ø.Dahl’s work (Comrie 1976, 1985; Bybee 1985, 1988; Dahl 1985, and, especially Bybee, Dahl 1989). According to the Bybee and Dahl approach, PERFECTIVE and PAST are viewed as primitives called universal gram types.


PAST grams indicate that a situation referred to by a clause occurs prior to the moment of speech. (By ‘past’ here I mean what Bybee et al. (1994:82 call SIMPLE PAST, that is, a category for which marking past time reference is the only function). By definition, PAST categories do not express any additional aspeutical meanings. A clear-cut example of PAST is the Preterit in German and corresponding categories in some other European languages (Tieroff 1999), that allow perfective, progressive, and habitual readings.

Morphosyntactically, as Bybee et al. 1994:91-92 have found, PAST and PERFECTIVE differ radically: the latter can be zero marked while the former can never be.

The present study follows the main lines of the analyses proposed within the Bybee and Dahl approach. In particular, it aims to provide additional data and examine in more detail three problems concerning cross-linguistic regularities in the distribution of PERFECTIVE and PAST grams.

First, while ‘perfective’ meaning is viewed as simple and indivisible, ‘imperfective’, since Comrie 1976 is regarded as complex, encompassing at least the following three: ‘progressive’, ‘habitual’, and, for static predicates, ‘ongoing state’. Therefore, ‘progressive’ + ‘habitual’ clustering is acknowledged as customary and, to some extent, «natural». But there are also language-specific categories associated with

* I am very much indebted to the inhabitants of the villages Kwanada (Daghestan) and Tat.Yaltan (Tatarstan) who served as informants on Bagwalal and Tatar. The financial support from Russian Foundation for the Humanities (RGNF grant N 98-04-06198) is gratefully acknowledged.

1 I follow the tradition established by Comrie (1976) in capitalizing labels of language-specific categories. Labels of universal gram types come in SMALL CAPITALS.
‘perfective’ + ‘habitual’ cluster, a quite distinct combination of meanings, that can not be regarded as instantiations of either PERFECTIVE, IMPERFECTIVE, or PAST. Although such a distinguished category as English Simple Past is among them, very little cross-linguistic data is available about how such categories develop, and how they interact with other categories and with surrounding lexical context.

Second, Bybee et al. 1994 as well as Dahl 1985 are mainly concerned with individual grams. Only a few claims have been made about possible verbal systems and possible stages of their development. One of such claims in Bybee et al. 1994 has to do exactly with the distribution of PERFECTIVE and PAST grams:

SYNCHRONICALLY, the main difference between a language that has a simple past and one that has a perfective is the presence or absence of a past imperfective. (Bybee et al. 1994:83) DIACHRONICALLY, inflectional perfectives can develop from anteriors when a past imperfective already exists in the language. (Bybee et al. 1994:91)

This claim seems to be somewhat controversial if compared to the rest of the theoretical generalizations in Bybee et al. 1994. The authors’ position is consistently anti-structuralist: they assume that development of ANTERIOR, PERFECTIVE, PAST, HABITUAL, EPISTEMIC POSSIBILITY, etc.is determined mostly by their semantic substance. However, when talking about the PERFECTIVE and its differences from the PAST, the authors adhere to the essentially structuralist view of perfective/imperfective «opposition», according to which distribution of a category is a subject of restrictions determined system-externally, by the contrast with other members of grammatical oppositions. Bybee et al. 1994: 149 suggest that this controversy arises because objectively the relation between perfectivity and imperfectivity domains is governed by other principles than relations between grams within each of these domains:

... it seems that there are certain major contrasts of universal validity — such as the basic distinction between the perfective domain and the imperfective, but that within these domains there are successive waves of grammaticalization which may follow upon one another at such a rate as to produce only very small and subtle semantic distinctions. (Bybee et al. 1994:149)

Although there is a good deal of motivation for this claim, there is a variety of language-specific grams crossing the border between perfectivity and imperfectivity, and ‘perfective’ + ‘habitual’ grams are among them. I believe that study of such grams will result in better understanding of the relation between PERFECTIVE and IMPERFECTIVE gram types.

Third, Bybee et al. 1994 provide massive data about cross-linguistic restrictions determined by the lexical class of a predicate. The vast majority of these restrictions reflect various asymmetries between static and dynamic predicates. But other distinctions, such as ‘telic’/‘atelic’ and ‘punctual’/‘durative’ pertaining to the domain of Aktionsart, (or, in other terms, ‘aspectual class’ (Vendler 1967), ‘actionality’ (Bache 1995, Bertinetto & Delfitto 1999), ‘taxonomic class’ (Paducheva 1995, 1996)), are also crucial for the distribution of aspectual grams. More elaborated theories accounting for interaction between aspect and Aktionsart (such as Smith 1991, Bree 1994, 1996) than those only operating with static/dynamic distinction have been mostly applied to verbal systems of individual languages. Cross-linguistic data about the behavior of, say, telic vs. atelic predicates are still very restricted, mostly to a few European languages (see, among others, Bertinetto & Squartini 1999, Janssen 1994, Klein 1995, and Tieroff (ed.) 1995). Among comprehensive studies of non-European languages Smith 1996 on
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Navajo, and Bhat 1999 on Indo-Aryan and Dravidian should be mentioned.

Given these considerations, I would like to examine ‘perfective + habitual’
categories traditionally labeled as Past Tense or Preterit in Bagwalal (Nakh-
Daghestanian, Andic) and Tatar (Uralic, Turkic). Preterits in these two geneti-
cally and areally unrelated languages demonstrate striking similarities in meaning
and distribution: both of them are neither prototypical PERFECTIVE nor PAST, and
both exhibit virtually the same lexical restrictions. In what follows I give will pre-
sent a brief overview of verbal systems of Bagwalal and Tatar (section 2), char-
terize the range of meaning and distribution of these categories, paying special
attention to their interaction with lexical context (section 3), and discuss possible
suggestions about their diachronic development (section 4).

2. Verbal systems of Tatar and Bagwalal

Major tense-aspect grams in Tatar are the Preterit, Perfect, Pluperfect, Past Imper-
fective, Present, Future 1, and Future 2 represented in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Partial verbal paradigm in Tatar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Conjugation</td>
</tr>
<tr>
<td>'go'</td>
</tr>
<tr>
<td>Preterit bar-d'y</td>
</tr>
<tr>
<td>Perfect bar-gan</td>
</tr>
<tr>
<td>Pluperfect</td>
</tr>
<tr>
<td>Future 1</td>
</tr>
<tr>
<td>Present</td>
</tr>
<tr>
<td>Past Imperf.</td>
</tr>
<tr>
<td>Future 2</td>
</tr>
</tbody>
</table>

Verbs in Tatar fall into two conjugations, depending on the type of the initial stem
from which the Preterit, Perfect, and Pluperfect are formed. Verbs of the 1st conju-
gation have a consonant initial stem and forms the Present by suffixing the marker a/ä, 
while verbs of the 2nd conjugation change the final vowel a/ä of the initial stem into
γ|i. Future 1 morpheme -r is suffixed to the initial stem in the 2nd conjugation; in the
1st conjugation the vowel γ|e is inserted between the stem and the affix. The majority
of verbal forms in Table 1 are formed by inflectional markers — -dγ|ẽ for the
Preterit, -gαn|gǎn for the Perfect, -r for the Future 1, and -a|ä for the imperfec-
tive grams — Present, Past Imperfective, and Future 2. Two periphrastic forms —
Pluperfect and Imperfect are both formed with i-ðe, the Preterit of the auxiliary i ‘be’.

Bagwalal verbal paradigm, part of with is represented in Table 2, exhibits a
number of similarities with the Tatar one: marking past time reference involves a
contrast between the Preterit and the Perfect, on the one hand, and between the
Preterit, and periphrastic Past Imperfective on the other. Pluperfect is also peri-
phrastic, resembling its Tatar counterpart. In the domain of future time reference,
then, there are two forms with subtle semantic difference.

Differences between the two systems are nevertheless significant. First, unlike
in Tatar, the Preterit in Bagwalal is zero marked: it is identical to the initial stem
that consists of the root and optional prefixal agreement marker. Second, the Perfect, the

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2 Aspect in Turkic languages has been studied extensively by L. Johanson (see, among others, Johanson 1971, 1996). For the general information on Tatar the reader may refer to Zakijev 1993. Aspect in Bagwalal as well as in other Nakh-Daghestanian languages has not been deeply investigated. See Gudava 1967 for the grammatical sketch of Bagwalal.
Present, and the Future 2 in Bagwalal are periphrastic: in contrast with Tatar, they are formed with the present auxiliary ek'a ‘am, is, are’ combined with perfective (marker -b-o) and imperfective (marker -(r)ā-X) verb forms and Future participle respectively. Third, there are two distinct present categories — the Present and the Present Habitual. The latter is identical to imperfective participle and, beyond expressing habitual meaning, functions as a narrative form. Its counterpart referring to the past situations, the Past Habitual, like other periphrastic past forms is formed with the past auxiliary b-uk’a ‘was, were’.

Table 2. Partial verbal paradigm in Bagwalal

<table>
<thead>
<tr>
<th></th>
<th>1 conjugation</th>
<th>2 conjugation</th>
<th>3 conjugation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterit</td>
<td>hec’i</td>
<td>eta</td>
<td>ŋē</td>
</tr>
<tr>
<td>Perfect</td>
<td>hec’i-b-o ek’a</td>
<td>eta-b-o ek’a</td>
<td>ŋē-b-o ek’a</td>
</tr>
<tr>
<td>Pluperfect</td>
<td>hec’i-b-o b-uk’a</td>
<td>eta-b-o b-uk’a</td>
<td>ŋē-b-o b-uk’a</td>
</tr>
<tr>
<td>Present</td>
<td>hec’i-rā-X ek’a</td>
<td>et-i-rā-X ek’a</td>
<td>ŋē-rā-X ek’a</td>
</tr>
<tr>
<td>Habitual</td>
<td>hec’i-rō-b</td>
<td>et-i-rō-b</td>
<td>ŋē-rō-b</td>
</tr>
<tr>
<td>Past Imperf.</td>
<td>hec’i-rā-X b-uk’a</td>
<td>et-i-rā-X b-uk’a</td>
<td>ŋē-rā-X b-uk’a</td>
</tr>
<tr>
<td>Past Habitual</td>
<td>hec’i-rō-b b-uk’a</td>
<td>et-i-rō-b b-uk’a</td>
<td>ŋē-rō-b b-uk’a</td>
</tr>
<tr>
<td>Future 1</td>
<td>hec’-a-s</td>
<td>et-a-s</td>
<td>ŋē-s</td>
</tr>
<tr>
<td>Future 2</td>
<td>hec’-ā-l-o-b ek’a</td>
<td>et-ā-l-o-b ek’a</td>
<td>ŋē-āl-o-b ek’a</td>
</tr>
</tbody>
</table>

3. Meaning and distribution of the Preterit

In both languages the Preterit has virtually the same distribution: they can produce perfective and habitual interpretations but not a progressive one. In sections 3.1-3.2 the Preterit under perfective interpretation in various lexical contexts is characterized. Section 3.3 deals with habitual interpretation of the Preterit.

3.1. ‘Perfective’ Preterit: static vs. dynamic predicates

It is not always easy to assign a feature ‘stativity’ to the whole lexeme. One inflected form of a verb may refer to a state, while another one — to a dynamic situation. (Here by ‘state’ I mean what Bybee et al.:318 call ‘state exists’: ‘the state begun before reference time and continues after reference time’).

Let us consider what types of situations are referred to by the Preterit and Present. Discussion in this section is mostly based on Bagwalal material; properties of Tatar forms are similar, unless otherwise indicated. For the moment I do not consider iterative situations (see section 3.3), taking into account only those uses of the Preterit and Present where they refer to a single situation, occupying continuous time span.

The verb b-ešā ‘put on’ represents a clear-cut case where both forms refer to a dynamic situation. Thus, ošu-r (erg.) butuna b-ešā (pret.) ‘He, put, on, a, hat,’ involves a complete situation in the past that has reached its resultant state. The Present in ošu-r (erg.) butuna b-eš-inā-X ek’a (pres.) ‘He, is, putting, on, a, hat,’ refers to one of the intermediate phases of putting-on process, as represented in Scheme 1A.

Let us assume, for simplicity, that the rest of the forms of the verb b-ešā ‘put on’ refer to a dynamic situation as well. In this case one can assign the feature [+dynamic] to the whole lexeme. The picture is not so obvious in all cases, however. In ʕali-ba (aff.) hā (pret.) mahammad ‘Ali, saw, Mohammed,’ the Preterit of hā ‘see’ refers to a change of state (‘not see’ → ‘see’), that is, to a dynamic situation. But the Present in ʕali-ba
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(aff.) hā-nā-X ek'a (pres.) mahammad 'Ali, sees, Mohammed,' produces a stative interpretation, referring to a resultant state of that change, see Scheme 1B.

In English see is regarded as stative, although saw refers not to an unbounded state in the past but rather to a change of state, as its Bagwalal counterpart does. I believe this tradition rests on intuition that the least morphologically marked form represents «pure» lexical meaning of a predicate, while addition of any morphological material results in a transformation of this meaning. English Present is less marked than the Preterit, so the meaning of the latter is assumed to be derived from the meaning of the former. On the other hand, in Bagwalal the same intuition leads to the conclusion that the meaning of the Preterit (that is, dynamic meaning) is initial, while the meaning of the Present is derived.

Scheme 1. Interpretations of the Preterit and Present

![Scheme Diagram]

Furthermore, one is tempted to assume that interpretation of the Present of hā 'see' can be predicted from the interpretation of the Preterit. In contrast with b-ešā 'put on' in Scheme 1A, the Preterit of hā 'see' denotes a punctual change of state that has no phase of development. This can be regarded a an evidence supporting the following generalization:

(1) If a situation referred to by the Preterit has a phase of development, the Present refers to this phase, otherwise it refers to some other phase of a situation.  

If (1) is true one can argue that the stative interpretation of the Present of the dynamic verb hā 'see' is an outcome of (1) applied automatically to all punctual predicates.

(1) seems to be too strong a generalization, however. Consider the verb b-iši 'seize, catch'. The Preterit of this verb is interpreted in virtually the same way as that of b-ešā 'put on' and hā 'see' (see Scheme 1C). But the Present allows two different readings. One reading occurs in ošu-r (erg.) L'anc'a b-iši-rā-X ek'a (pres.) 'lit. He, is, catching, a, hare,' another in ošu-r (erg.) qoča b-iši-rā-X ek'a (pres.) 'He, is, holding, a, book.' (see Scheme 1C).

(1) predicts only the interpretation 'be catching', but not 'be holding', a resultant state of 'catch'. This shows that the relation between the Preterit and the Present cannot be fully accounted for by (1), and thus should be specified separately for every verbal lexeme. For such a specification I propose a format represented in (2), where not a value of single binary feature, but rather a pair of values is involved:

(2) \(<S(\text{Preterit}), S(\text{Present})>, \text{where } S(x) \subset \{\langle s(tative)\rangle, \langle d(ynamic)\rangle, \langle s\rangle\langle d\rangle\}\). 

Thus, the verbs b-ešā 'put on (a hat)', hā 'see', and b-iši 'seize' are assigned specifications <d;d>, <d;d>, and <d; d'> respectively.

In Bagwalal verbs with stative Preterit are almost totally lacking. Exceptions

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3 The formulation «some other phase» is chosen because generally not only a resultant state of a situation may be taken into account, but also a preparatory state or process. For example, He is coming refers to a process occurring before the punctual event He came.
could be counted on the fingers of one hand. One of such is b-uk′a ‘be’, that can refer to an unbounded state in the past, as in iši b-ā-b-q′alani, asijat j-uk′a (pret.) ungiri 'When we, came, Asijat, was, there'.

S(Present) of the verb b-uk′a ‘be’ is rather not defined than equal to «s»:

(3) mahammad anžı-łaa buk′-urā-X ek′a.
Mohammed Anzhı-LOC be-IPFV-CONV AUX:PRS
Mohammed regularly visits Anzhi. || *Mohammed is in Anzhi.

As (3) demonstrates, the Present of b-uk′a does not produce ‘state exists’ interpretation; (3) can only refer to a multiple situation such that the proposition ‘Mohammed is in Anzhi’ is true for some time spans and false for others.

Crucially, there are no verbs of the type <s; d>: the Preterit is never less dynamic than the Present. Therefore, Bagwalal can be characterized as consistently stativity increasing (adopting Hopper & Thompson’s (1980) term for transitivity): the more marked a verbal form is, the higher is the probability of obtaining stative interpretation of this form. In this respect Bagwalal differs considerably from stativity decreasing languages like English in which more marked are verbal forms denoting a change of state (e.g. heard is more marked than hear).

The Preterit in Tatar resembles the Preterit in Bagwalal with respect to the stativity. As in Bagwalal, there virtually no verbs with S(Preterit) = «s». Furthermore, the verb ‘be’, which is <s, −> in Bagwalal, in Tatar is <d；s, −>. The Preterit of this verb not only can refer to an unbounded state in the past, as Bagwalal Preterit does, but also to a change of state. Thus, for instance, Rašit ukṣtuč′r bul-d′r (pret.) yields two readings — ‘Rashid, was, a2 teacher,’ and ‘Rashid became a teacher’.

In Tatar the Present is not more marked than the Preterit (see Table 1), it is equally marked or, one can argue taking into account shortness of the imperfective affix, more marked. Consequently, depending on what point of view is preferred for, Tatar can be characterized as either a language with no correlation between morphological complexity of a verbal form and stativity, or as stativity decreasing.

3.1. ‘Perfective’ Preterit: telic vs. atelic predicates
As the above discussion has shown, in both Bagwalal and Tatar the Preterit of the vast majority of verbs refers to a dynamic situation. Dynamic interpretations of the Preterit, then, fall into two major classes. (In this section Tatar material is mostly presented, but what is said about Tatar holds for Bagwalal as well.)

First, the sentence bʁz erā-de (pret.) ‘ice, melted,’ indicates that the situation has reached its resultant state, that is, all of the ice turned into water. Second, the sentence Rašit ešlā-de (pret.) ‘Rashid worked (for a while)’ signals that the situation is temporally bounded, as there was a moment in the past when the situation launched and another moment when it terminated, but no definite result state was attained. These interpretations are represented in Scheme 2.


4 Some linguistics regards telicity as inherent semantic characteristic of a predicate, reserving ‘boundedness’ to denote actual interpretation an inflected verbal form produces in an utterance (see discussion in Depraetere 1995). However, I adhere to a more widespread point of view and treat these terms as synonymous.
ers). There is a general agreement that telicity is responsible for both intra- and cross-linguistic variation. Intra-linguistically, telic vs. atelic predicates differ as to their co-occurrence restrictions. Typologically, two types of perfectivity are distinguished depending on whether perfective grams are more readily available in telic contexts (as in Slavic languages, hence the term ‘Slavic-style aspect’ (Dahl 1985)) or both telic and atelic predicates favor perfective grams equally.

Scheme 2. Main interpretations of the Preterit.

As in the case of stativity, a verbal lexeme generally can not be unambiguously characterized as either telic or atelic, as in both Tatar and Bagwala there is massive ambiguity in the use of the Preterit. For instance, zehrā tabaq-sawx juddi-y (pret.) ‘Zuhrə washed-up, lit. Zuhra, washed, dishes,’ is ambiguous between two readings represented in Scheme 2. The first, ‘Zuhra accomplished washing-up’ implies that the resultant state ‘dishes are clean’ is attained, while the second, in contrast, indicates that for a certain period of time Zuhra was engaged in washing-up activity with no reference as to whether this activity was directed towards any resultant state.

There is tradition of description of European languages according to which predicates of this kind are considered inherently telic, while atelic interpretation is attained by detelicization. Among factors triggering detelicization the following are frequently mentioned: adverbials of duration like for two hours, characteristics of a direct object of a transitive verb (in particular, definiteness and specificity), and imperfective aspectual grams such as progressive (see Binnick 1991:190; Depraetere 1995, Bertinetto & Delfitto 1999). The question of whether telic/ atelic distinction still exists in progressive contexts is beyond the scope of this paper, but the other two factors are worth discussing in detail.

The properties of the object are, in fact, crucial for determining telicity of the verbal phrase, cf. play piano vs. play a sonata or famous Dahl’s (1985) ‘writing letters’ example. Thus, in Tatar there is a choice between the nominative and accusative case marking of the direct object which is determined by the definiteness of an object NP. In Əl xat-lar || xat-lar-nər (pl., nom || pl., acc.) jaz-dər (pret.) ‘he, wrote, letters,’ atelic interpretation ‘he was engaged in writhing letters for some time’ of the Preterit is associated with the indefinite direct object, while the definite direct object implies that the situation has reached a resultant state, that is, all the letters have been written.

Meanwhile, I see no serious reasons to assume these effects support the claim that telic interpretations is primary while atelic is derived, and therefore, that predicates like Tatar jazu ‘write’ are inherently telic. It would have been the case

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5 Another suggestion, to which I do not adhere, has been put forward recently by V. Plungian (1998). He assumes that difference between erä-de ‘melted’ and ešlā-de ‘worked’ has to do not with lexical, but with grammatical ambiguity. ‘Perfective’ is regarded not as a single atomic meaning: it splits into ‘completive’ (= ‘the situation attained the resultant state’ ≈ ‘telic’) and ‘limitative’ (= ‘the situation started and after taking place for some time canceled’ ≈ ‘atelic’).
had definiteness been the default NP reference type: it is natural to assume that in the default morphosyntactic environment (i.e. definite) the default interpretation of a predicate (i.e. telic) is realized. But this suggestion is far from obvious: in Tatar non-definite, morphologically marked option is exactly definiteness.

Predicates, then, differ with respect to the co-occurrence with adverbials like in two hours and for two hours. In both Tatar and Bagwalal there are items only compatible with for two hours or with in two hours. For example, in Bagwalal mahammad-i-ba (aff.) pat'imat b-ečiča (pret.) ‘Mohammed, forgot, Fatima,’ can only be modified by č'era rešen-ini (interess.) ‘in two years’, while mahammad šardı (pret.) ‘Mohammed had a walk, lit. walked’ — by č'era sašat-ir (erg.) ‘for two hours’.

But a considerable portion, if not the majority of Preterits in both Bagwalal and Tatar easily co-occur with both types of adverbials producing either telic or atelic interpretations. In Tatar, for instance, zehra idän-ne (acc.) seberä-de (pret.) ‘Zukhra, swept, the, floor,’ allows both ike sagat-ta (loc.) ‘for two hours’ and ike sagat ečendä ‘in (lit. inside,) two, hours’.

Finally, Preterits of ‘write’ and ‘sweep’ type in both Bagwalal and Tatar can be interpreted as atelic without any overt trigger of detelicization provided that the pragmatic context favors such a reading. In (4), for example, there is no adverbials of duration, and the direct object is definite, yet it is quite naturally interpreted as atelic, if Mohammed’s field is too big to be plowed in one day.

(4) mahammad-i-r, baq'ada hec'i-w-o, ĥuša b-eL'i, hē
Mohammed-OBL-ERG, early rise-M-CONV field N-plow:PREF then
eša w-ā
home M-come:PREF
Mohammed got up early, plowed (his) field, and returned home.

These data suggest that we are not likely to deal with detelicization of inherently telic predicates. Rather, in accordance with Declerck 1979, verbs like b-eL'i ‘plow’ in (4) are most adequately treated as not specified for a particular value of telicity (or, if one likes, specified for both). If so, the specification for the telicity of the Preterit looks as follows:

(5) <T(Preterive)>, where T(x) ⊂ \{«t(elic)»; «a(telic)»; «t|a»\}

In Tatar the proportion of verbs that allow for atelic interpretation is considerably higher than in Bagwalal. Thus, for dozens of (t) and (t|a) Bagwalal verbs corresponding verbs in Tatar are (t|a) and (a) respectively. For example, the Preterit of the Bagwalal verb Lihā ‘sleep’ can be interpreted as either fell asleep’ or ‘slept for some time’. Corresponding Tatar verb jırk'ra-u ‘sleep’ produces only the latter interpretation and can not refer to the change of state ‘fell asleep’. At the same time, there are virtually no atelic Bagwalal verbs with telic Tatar counterparts.

To sum up, data from Tatar and Bagwalal points towards at least two essential parameters of cross-linguistic variation. First, the proportion of verbs that allow both telic and atelic readings may vary across languages. For Russian Perfective verbs this proportion is zero, in English there is a number of such verbs, and in Bagwalal and Tatar their amount is even higher. Second, the same situation may be projected into the verbal lexicon as telic in one language and as atelic in the other, and languages can vary as to what types of a situation they choose for telic (vs. atelic) representation. Moreover, this variation is not arbitrary: an implicational relation
holds between lexical classes in Tatar and Bagwalal, such that if a Tatar verb is of <tja> type, we do not expect a corresponding Bagwalal verb to be of <a> type. The nature and cross-linguistic validity of such relations require, of course, further examination, but it does not look impossible that there are universal restriction on accessibility of certain types of situations for telic (resp. atelic) representation.

3.3. Habitual interpretation

The above discussion has concerned the perfective use of Preterits in Bagwalal and Tatar. But the distribution of the Preterits covers also habitual contexts. (a-b) (cf. Ö.Dahl’s (1985) TMAQ #91, 98) allow two different readings — perfective proper and habitual — not admitting the progressive reading.

(6) a. ul jetker-de (Tatar) b. o-w ohorí (Bagwalal)
   he cough-PRET this-M cough:PRET
   He coughed {once} || {Last winter he used to catch a cold.} He coughed
   {all the time} || *(When I came in,) he was coughing

The ranges of meanings of the Preterit overlaps with that of the Past Imperfective, associated with progressive and habitual meanings, as (a-b) show.

(7) a. ul jetker-ä i-de (Tatar)
   he cough-IPFV AUX-PRET
   b. o-w ohor-ä-X b-uk’ä (Bagwalal)
      this-M cough-IPFV-CONV N-AUX:PRET
   {Last winter he used to catch a cold.} He coughed {all the time} || {When I
   came in,} he was coughing

Semantic contrast between the habitual Past Imperfective and Preterit is evident only if S(Preterite) = «s». In this case imperfective forms in both Bagwalal and Tatar imply iterative nature of the situation: the proposition is true at some temporal intervals and false at others. (3) from Bagwalal cited in section 3.1 is an example of this. In a similar fashion, in Tatar the Preterit has ‘state exists + past’ interpretation. Occurring in Zakir bu awr-tda (loc.) bul-d’s (pret.) ‘lit. Zakir, was in, this, village,’ it implies that Zakir lived in the village, while the Past Imperfective bul-a i-de implies that he visited the village from time to time.

When S(Preterite) = «d», difference between the habitual Preterit and habitual Past Imperfective is scarcely visible. Many speakers considers them completely synonymous. Others suggest minor differences such as that observed in Zehrä idän-ne (acc.) seberä-de (pret.) || seber-i i-de (past imperf.) ‘Zuhra, (regularly) swept, the, floor.’ The Past Imperfective can produce a pragmatic implication that a habitual situation occurring in the past does not last in the present. The Preterit is never associated with such an implication.

Another difference between the two habitual forms is demonstrated by kür-ä ‘see, meet’ in Rašit här wakšt marat-n’ (acc.) kür-de (pret.) || kür-ä i-de (past imperf.) ‘Rašit, constantly (lit. every time) met, Marat.’ The Preterit tends to refer to customary habitual situations every repetition of which are enforced by some social or physical condition. Repetitions of a habitual situation referred to by the Past Imperfective are viewed as a matter of pure coincidence.

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6 In Bagwalal, where in addition to the Preterit and Past Imperfective there is a Past Habitual occurring in past habitual contexts, synonymy is even more prominent than in Tatar.
Meanwhile, these differences seem to be a matter of preference and not a strict rule. They are pragmatically unstable and hardly allow typological generalizations. But I assume that similarities in the distribution of the Preterit and Past Imperfective are more significant than differences. In the light of Bybee et al. 1994:83 cited in section 1 who predict that **PERFECTIVE VS. IMPERFECTIVE** grams tend to establish maximal contrast, difference between the Past Imperfective and Preterit is what we can expect. What we are not likely to expect is exactly the existence of a group of contexts where the meaning of the Preterit and Past Imperfective are virtually indistinguishable.

Bagwalal and Tatar provide evidence that the domain of aspectual meanings is not obligatory shaped in such a way as to produce maximal contrasts. Indeed, in these languages synonymy exists not only within perfective and imperfective domains, but also across these domains. Therefore, maximal contrasts emerging in English (‘perfective’ + ‘past habitual’ vs. ‘past progressive’) or Russian (‘perfective’ vs. ‘past habitual’ + ‘past progressive’) but absent in Tatar and Bagwalal can be best viewed as a parameter of cross-linguistic variation.

4. **The Preterit: restricted PAST or extended PERFECTIVE?**

Synchronic distribution of the Preterits in Bagwalal and Tatar discussed above requires a diachronic interpretation. According to Bybee et al. 1994, expected distribution of the overtly marked Preterit in Tatar is that of the PAST; zero marked Preterit in Bagwalal is expected to behave like PERFECTIVE. Yet the two categories are associated with virtually the same range of meanings, neither PAST nor PERFECTIVE.

The possible suggestion about the Preterit in Tatar is that originally it was a PAST contrasting with no imperfective category in the domain of the past time reference. Then the development of the Past Imperfective results in that the meaning of the old PAST was reshaped, and its distribution became more restricted. (M. Haspelmath (1998) has offered a detailed characterization of such development in the domain of present imperfective categories.) This accounts for ‘habitual’ and ‘state exists’ (with stative predicates) uses of the Preterit and for its potential to refer to atelic situations. These properties are not surprising for the PAST: indeed, the PAST is readily available in ‘habitual’ and ‘state exists’ contexts provided that a situation occurs prior to the moment of speech; besides, the PAST imposes no restrictions on the Aktionsart of a predicate. Now we have such a stage of development where the old PAST has lost the progressive reading which is seized by the developing Past Imperfective, while other semantic characteristics survived.

The same account applied to the zero marked Bagwalal Preterit is appreciably more problematic: postulating for Bagwalal the same path of development as for Tatar will result in acknowledgment of zero marked PASTs. In fact, the Preterit in Bagwalal apparently represents a «perfective-from-zero» case (see Bybee et al. 1994: 90-91, Bybee 1994). But if «perfective-from-zero» hypothesis is true, viz. the development of zero marked PERFECTIVES is a side effect of the development of IMPERFECTIVE, then before this development starts, the zero marked category has the distribution of the PAST. But zero marked PASTs are not allowed by the theory, and the whole situation looks like a vicious circle.

I suppose, therefore, that restrictions on the distribution of zero-marked grams should be relaxed a little. In particular, I adhere to the «default» view of zero marked categories put forward in Dahl 1985, according to which an unmarked category can occupy the whole semantic space not associated with any other categories. This view allows zero marked Preterit to cover the whole domain of past time reference given that there is no overtly marked category associated with (part of) the same domain.
Between Perfective and Past

If so, the Bagwalal Preterit at some diachronic stage may have the same distribution as the Tatar Preterit and than enter the same process of development.

Ultimately, the cross-linguistic properties of 'perfective' + 'habitual' categories require further examination. The present study dealing with only two languages, although genetically and areally unrelated, should be regarded not as typological but rather as pre-typological. Nevertheless, I assume that striking similarities observed above are unlikely to be a result of coincidence, and it will not be too much surprising if as soon as new typological evidence appears, out knowledge about the relation between 'progressive', 'habitual', and 'perfective' changes.

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