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Foreword

We are pleased to present the proceedings of the BLS 35 Special Session on Non-Speech Modalities, held at UC Berkeley in February 2009. We would like to thank the contributors to this volume and all those who attended and participated in the conference, as well as those at UC Berkeley whose generous support made the conference possible: the Office of the Dean of Social Sciences, the Graduate Assembly, the Student Opportunity Fund, and the Departments of Linguistics and Anthropology.

Iksoo Kwon, Hannah Pritchett, and Justin Spence

Volume editors

SPECIAL SESSION:

NON-SPEECH MODALITIES

Decomposing the Non-Manual Tier: Cross-Modality Generalisations*

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0. Introduction

In this paper we investigate the role of the features of the non-manual tier in interrogatives in Turkish Sign Language (TİD). We propose that the non-manual tier is in fact decomposable, and its individual features have distinct grammatical functions. We also draw attention to a parallelism we have observed in a spoken language, Turkish, where the intonational contours of interrogatives are not monolithic prosodic entities, but are rather composed of distinct prosodic contours designated for grammatical functions, similar to TİD.

1. The Non-Manual Tier in Sign Languages

It has been proposed that the non-manual tier in sign languages has similar functions to intonation in spoken languages (Sandler 1999). Similar to intonation, the non-manual signs may mark different utterance types such as questions, negative statements, topic/focus constructions and commands. Specifically in interrogatives, Zeshan (2004) observes that what is referred to as the "non-manual tier" may consist of a number of distinct non-manual signs such as raised eyebrows, wide open eyes, eye contact with the addressee, forward body posture, mouthing and the forward or backward tilt of the head. She also observes that the presence and absence of these non-manual signs vary from language to language, and between polar and content questions.

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2. The Role of the Non-Manual Tier in Interrogatives in TİD

For TİD interrogatives, we have observed similar non-manual signs such as those involving the eyes, eyebrows, body posture and position of the head. In this study we focus on the features related to the head. The data are from our recordings of free and structured dialogues and game playing (What/Who am I), that took place in 2007-2008 in Istanbul.

Regarding the head features, we have observed that in polar questions, repetitive head nod accompanies forward tilt of the head, whereas in content questions left-to-right head shake accompanies backward tilt of the head. However, the spread domain of the two signs in each question type may or may not overlap. Specifically, whereas backward or forward tilt of the head spreads over the entire utterance, head nod or head shake may start later or end earlier. (1) is an abstract representation of this observation:

(1) a. *Yes/No Questions*

head nod
head forward

b. *Content Questions*

head shake
head backward

(2a) provides an example of a polar question where head forward and head nod overlap completely, whereas in (2b) head nod ends earlier than head forward.

(2) *Yes/No Questions*

a. hn
hf
REMEMBER
'Do you remember?'

b. hn
hf
NOW SAME NOW SAME
'Is it still the same now?'

In (3a) below head backward and head shake overlap completely, whereas in (3b) head shake starts later.

(3) *Content Questions*

a. hs
hb
HEY LAW LAW WHAT/HOW THERE.IS WHAT/HOW
'What (kind of) legislation is there?'

b. hs
hb
PERSON WORK WHAT DO WHAT
'What (kind of) work does the person do?'

Notice that in both kinds of interrogatives the head is not in its neutral position; namely, it is tilted on the forward-backward axis. Since the tilted position of the head is retained from the beginning until the end of the utterance, the muscles of the neck seem stiffened as well. This is in contrast with declaratives. In declaratives, the head is not tilted, it moves in various directions, and the neck is relaxed. Based on the contrast between interrogatives and declaratives, we would like to propose that the head tilt is a phonologically distinctive feature that distinguishes interrogatives from declaratives; that is, it clause-types interrogatives as such.

3. The Semantic/Pragmatic Functions of Phonological Features

In Göksel, Kelepir and Üntak-Tarhan (2008, 2009) we propose that interrogatives consist of (at least) two pragmatic components: the first component is a *prompt* for a response, which is an overarching property present in response seeking utterances in general, distinguishing them from other types of utterances such as declaratives, wishes etc. We show that in Turkish the prompt-for-a-response function is expressed by a designated prosodic contour, and is present not only in interrogatives, but also in other response seeking constructions.

The second component is related to the *type* of response demanded from the hearer: the confirmation or denial of a statement (as in yes/no questions) or the content of a constituent (as in content questions). In the same work, we also identified designated prosodic contours in Turkish which express these different kinds of responses sought. We will present these prosodic contours in Turkish in Section 4 below.

Returning to TİD, we would like to propose that the head tilt signals the first pragmatic component of interrogatives discussed above, namely, the prompt for a response. The type of response sought, on the other hand, is expressed by the position of the tilted head: if it is tilted forwards, the response sought is the confirmation or denial of a statement (as in yes/no questions), and if it is tilted backwards, it is the content of a constituent in a proposition that is sought (as in content questions).

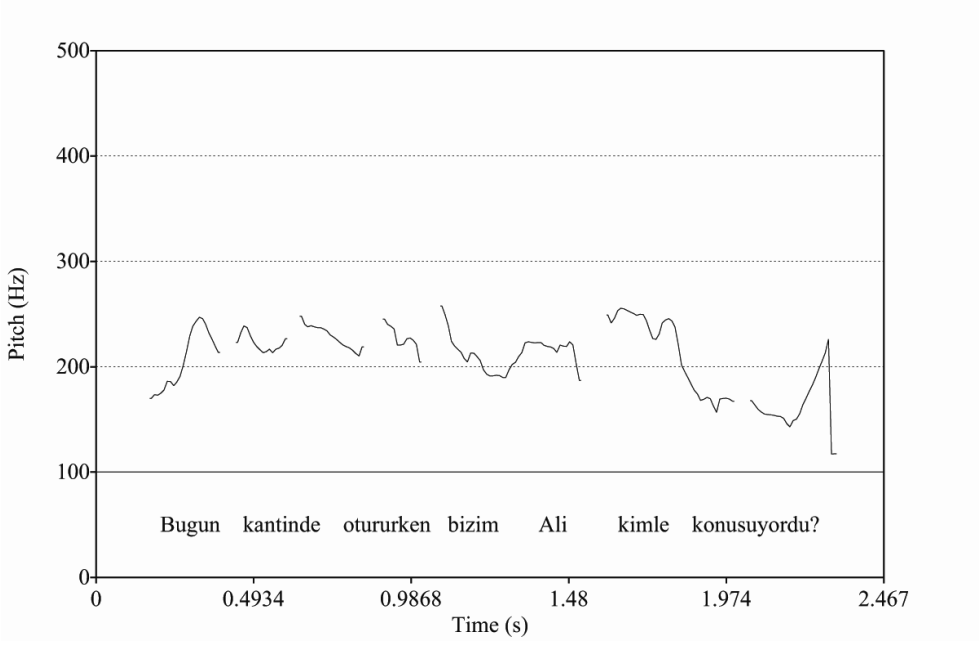
4. Cross-Modality Implications

In Section 3 we proposed that the prompt for a response is expressed by a distinct non-manual sign in TİD, namely, the head tilt. In this section we would like to discuss the distinct pitch contours observed in Turkish that express the same pragmatic function.

In Göksel, Kelepir and Üntak-Tarhan (2008, 2009), we argue that the intonational contours of a number of response seeking constructions - including the two types of questions - contain a prosodic component which involves compressed pitch observed as a high plateau, and which starts at the onset of the utterance. The two types of interrogatives differ, on the other hand, in the second prosodic component that follows: whereas polar questions end with a sequence of H*L%, content questions end with H*LH%. Since the first component is present in a number of response seeking construction types and is not present in, say, declaratives, we propose that this prosodic component expresses the pragmatic function "prompt for a response". The examples (4) and (5) below show the contrast between the intonational contours of a response seeking utterance and a declarative. Notice that these examples have identical lexical items up to the object of the main verb *konuşuyordu* 'was talking'.

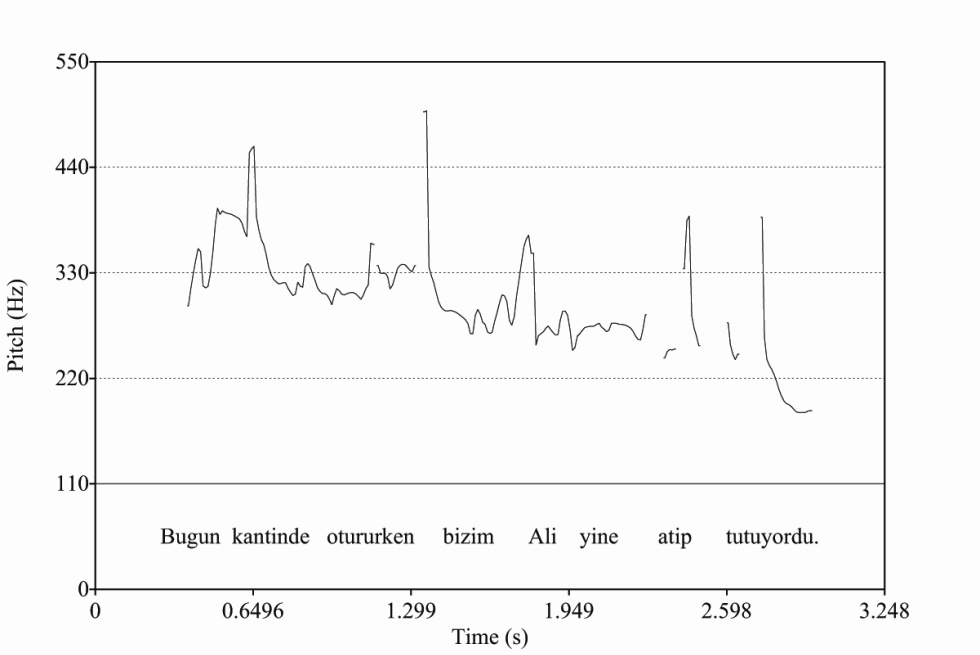
(4) is an example of a content question, and (5) is an example of a declarative. Concentrating on the initial part of the intonational contours of these examples, notice that whereas the intonational contour of the content question in (4) displays compressed pitch at a higher level of the speaker's pitch range, the intonational contour of the declarative in (5) has a sequence of high and low tones; that is, the pitch is not compressed.

(4) *Content Question*



Bugün kantin-de otur-ur-ken bizim Ali **kim**-le konuş-uyor-du?
today canteen-LOC sit-AOR-ADV our Ali **who**-COM talk-IMPF-P.COP
'When we were sitting at the canteen today, who was Ali talking to?'[1]

(5) *Declarative Clause*

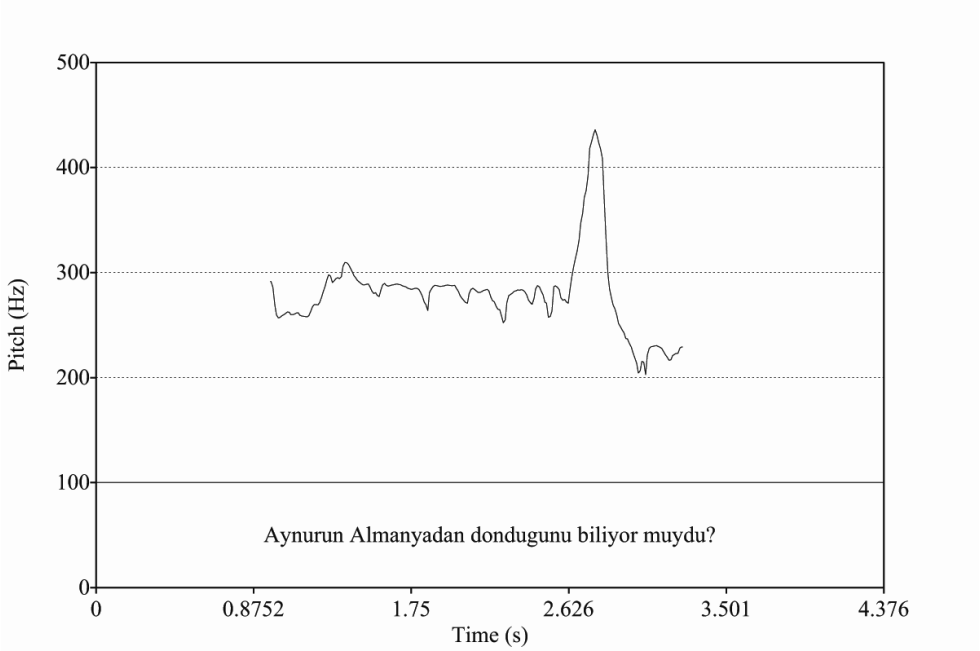


Bugün kantin-de otur-ur-ken bizim Ali yine atıp tut-uyor-du.
today canteen-LOC sit-AOR-ADV our Ali again tell.tall.tales-IMPF-P.COP
'When we were sitting at the canteen today, Ali was again telling tall tales.'

To illustrate how polar questions and content questions are differentiated prosodically, the intonational contours of these two types of interrogatives are provided below. Notice that both start with a compressed pitch/high plateau, but the polar question ends with a high pitch accent followed by a low boundary tone (H*L%), as shown in (6), whereas the content question ends with a high pitch accent followed by a combination of a low tone and high boundary tone (H*LH%), as shown in (7).

[1] The glosses used in the examples in this article are as follows: ABL: ablative; ACC: accusative; ADV: adverbial suffix; AOR: aorist; COM: commitative; COMP: complementizer; GEN: genitive; IMPF: imperfective; LOC: locative; P.COP: past copula; POSS: possessive; PRES: present; Q.PART: question particle.

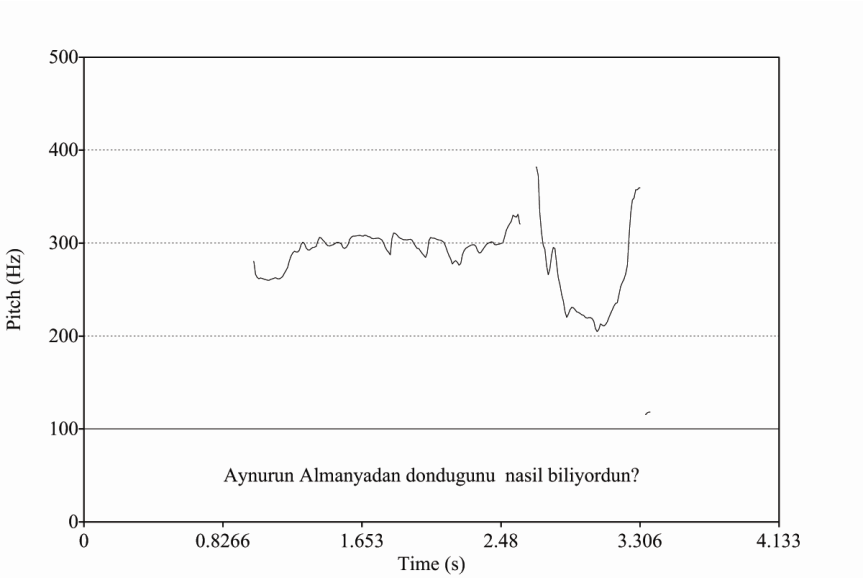
(6) *Yes/No Question*



Aynur-un Almanya-dan dön-düğ-ün-ü bil-iyor
Aynur-GEN Germany-ABL return-COMP-3SG.POSS-ACC know-IMPF

mu-ydu?
Q.PART-P.COP
'Did s/he know that Aynur had returned from Germany?'

(7) *Content Question*



Aynur-un Almanya-dan dön-düğ-ün-ü **nasıl**
Aynur-GEN Germany-ABL return- COMP-3SG.POSS-ACC **how**

bil-iyor-du-n?
know-IMPF-P.COP-2SG
'How was it that you knew that Aynur had returned from Germany?'

To summarize, TİD and Turkish, even though they belong to different modalities, show similar properties with respect to the interaction between the pragmatic and prosodic components of interrogatives. The prompt-for-a-response function is expressed by the head tilt in TİD and by the high plateau in Turkish; the type of the response sought is expressed by the forward vs. backward tilt of the head in TİD, and in Turkish the low vs. high boundary tone differentiates between yes/no and content questions. As for head nod and head shake in TİD, these are also associated with yes/no questions and content questions (see Göksel, Kelepir and Üntak-Tarhan, forthcoming).

The difference in the modalities of these two languages manifests itself in the way these partitionings are organized. In TİD, a sign language, the non-manual signs in interrogatives express the different pragmatic functions *simultaneously*, whereas in Turkish, a spoken language, the prosodic components expressing designated pragmatic functions occur *sequentially*.

5. Clause-Typing

We would like to propose in this section that the suprasegmental features expressing a prompt for a response in TİD and Turkish also have a syntactic function, namely, clause-typing.

What clause-types intrerrogatives as such has been a very productive topic in the literature on syntax. It has been observed that while some languages such as English employ word order variation (subject-auxiliary inversion) to mark the difference between interrogatives and declaratives, others such as Chinese, Korean and Japanese employ question particles. Yet, there are other languages which have the option of marking the difference through intonation such as French and Hindi. (8) and (9) provide examples from French and Hindi respectively.

(8) French

a. *Yes/No Question*
Jean a acheté un livre?
Jean has bought a book
'Has Jean bought a book?'

b. *Declarative Clause*
Jean a acheté un livre.
Jean has bought a book
'Jean has bought a book.' (Cheng and Rooryck 2000)

(9) Hindi

a. *Yes/No Question*
bacca bemar hai
child ill be.3SG.PRES
'Is the child ill?'

b. *Declarative Clause*
bacca bemar hai
child ill be.3S.PRES
'The child is ill.' (Zeshan 2004)

The majority of sign languages has been observed to be of the French/Hindi-type; that is, marking utterances as interrogatives through only suprasegmental features. Zeshan (2004) observes that polar questions are invariably marked with non-manual signs, and question particles are optional where present. Aboh & Pfau (forthcoming), Pfau (2006), Lillo-Martin & Sandler (2006), among others, report that even some content questions may lack question words, and are marked as such through non-manual signs. Consider (10) and (11) below. The examples from Israeli Sign Language in (10) are examples of content questions but they do not contain any wh-phrase.

(10) Israeli Sign Language (Meir 2004)

a. cont.q
TIME
'What time is it?'

b. _____cont.q
HEALTH INDEX2
'How are you?'

In (11a) below there is no manual sign (i.e. lexical item) that indicates that the utterance is a question. (11a) and (11b) differ only in non-manual signs.

(11) Indo-Pakistani Sign Language (Zeshan 2004)

a. *Yes/No Question*
_____y/n
BOOK INDEX INTERESTING
'Is the book interesting?'

b. *Declarative Clause*
_____top
INDEX BOOK INDEX INTERESTING
'As for the book, it is interesting.'

Regarding the syntax of clause-typing, the feature that marks a clause as an interrogative has been commonly attributed to a head in the functional domain of a clause, higher than IP, which attracts the auxiliary in English-type languages, and hosts the question particle in Chinese-type languages. Even though in the French-type languages it is only the intonational contour that marks a clause as an interrogative, the relevant feature is still attributed to this functional head with analogy to the first two types of languages mentioned above. Specifically, Cheng & Rooryck (2000) and Aboh & Pfau (forthcoming) argue for intonation to be a Q(uestion)-morpheme which realizes the [+question] feature of the head of the clause. This head may be C^0 or $Inter^0$ in line with various proposals (see Pfau 2006 and references therein), but for the sake of simplicity, we refer to it as C here. We believe TİD interrogatives support the proposal put forth in these works; namely, TİD is another language where suprasegmental features clause-type interrogatives.

6. Conclusion and Implications

In this paper we have argued that there are designated suprasegmental features that (i) distinguish declaratives from response seeking utterances, and (ii) distinguish the yes/no questions from content questions. We suggest that these functions occur both in spoken and in signed modalities, as illustrated below:

(12) Comparison of TİD and Turkish:

	TİD		TURKISH	
Prompt- for- a-response function	Head Tilt		High Plateau	
Subtypes of questions	*yes/no Q*	*content Q*	*yes/no Q*	*content Q*
	head forward head nod	head backward head shake	H*L%	H*LH%
Mode of encoding	simultaneous partitioning		sequential partitioning	

In both TİD and Turkish, interrogatives provide further support for the hypothesis that suprasegmental features (non-manual signs in sign languages, intonation in spoken languages) can be clause-typers.

At this point we would like to raise a question regarding the syntax of clause-typing: as mentioned in Section 5, the claim that the feature that marks utterances as [+question] resides in C is based on an assumption and an observation: the assumption is that the highest head in the clause, C, contains the feature(s) expressing the illocutionary force of the clause. The observation that question

particles in head-final languages occur in clause-final positions, and that the inflected verb dislocates to a position higher than the subject in head-initial languages has been argued to show that the particles reside in C, and the inflected verb moves to C to check question-related features. The case with non-manual signs/intonation as markers of interrogatives is less clear, however. Since suprasegmental features, by nature, do not have visually or auditorily observable positions within the utterance, and they spread over the entire utterance, it is impossible to pinpoint their specific position in syntax. The question that arises is: is the clause-typer non-manual sign/intonational contour located at the ***left*** periphery of the clause because it starts at the onset of the utterance, or is it located at the ***right*** periphery of the clause because it coincides with the end of the utterance?

We would like to end our paper with a speculatory note on the phonetic and phonological parallelism between TİD and Turkish suprasegmental features of interrogatives. Recall that the prompt for a response corresponds to a compressed pitch contour forming a high plateau at the beginning of the utterance in Turkish. Note that the intonation associated with compressed pitch forces the speaker to keep the frequency of the vibration of the vocal cords steady to achieve a compressed pitch. This is in contrast with the pitch contour of declaratives. Uttering a declarative involves variation in the frequency of the vibration of the vocal cords, and the pitch contains a random sequence of high and low tones. Uttering declaratives then might involve a more relaxed manner in contrast to interrogatives.

This reminds us of our observation in TİD that whereas the articulation of interrogatives involves a steady head tilt resulting in the stiffening of the muscles of the neck, the articulation of declaratives involves relaxed head movements in various directions. Unless this parallelism in these two languages of different modalities is totally coincidental, it may be showing that interrogatives are more marked than declaratives if we—very informally—assume that "minimal physical effort" signals the unmarked utterance type as opposed to "forced physical effort".

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Nepali Sign Language and Nepali: Social and Linguistic Dimensions of a Case of Inter-Modal Language Contact*

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0. Introduction

In this paper, I examine inter-modal language contact between Nepali Sign Language (NSL) and Nepali, focusing particularly on the semantic domain of kinship. As one aspect of an on-going research project, this paper draws on five months of preliminary fieldwork with deaf communities and individuals in Nepal.[1] In the original paper presented at BLS 35, I showed how NSL, which developed in the last few decades in a primarily Nepali-speaking environment, exploits modality-specific resources in its systematic replication of the Nepali language kinship domain. I argued that in light of the data, we should rethink either Winford's (2003) implicational constraints on lexical and structural borrowing and/or how the term 'borrowing' makes presumptions about social-linguistic relationships that do not necessarily apply to (at least this) signed language. While maintaining the original empirical and theoretical material, the current version also incorporates new ideas that have arisen from the process of presenting, receiving feedback on, and rewriting this paper.

1. Background

Language contact scholars, like linguists more generally, have concentrated almost exclusively on spoken languages. There are important exceptions to this

* I would like to offer my thanks to the many deaf Nepalis who have patiently and generously shared with me their time and language; to the NFDH for its permission to reproduce entries from its dictionary; to Lev Michael and the members of his Fall 2008 language contact seminar, especially Jess Cleary-Kemp for pointing out the sociological inadequacy of the term 'borrowing'; to Erin Wilkinson for so collegially sharing her cross-linguistic data; to Ulrike Zeshan and John Haviland for insightful and provocative comments at BLS; to Elisabeth Wehling, Iksoo Kwan, and Mindi Sue Spike Shepherd for their valuable assistance in preparing the original presentation; to Terra Edwards and Michele Friedner for their excellent suggestions for improving the written version; and to Dristi Shrestha for checking my Nepali script. All errors are obviously my own.

[1] My use of lower-case 'deaf' and the abbreviation NSL both follow the English-language practices of the Nepal National Federation of the Deaf and Hard of Hearing (NFDH).

trend, and Quinto-Pozos's (2007) introduction to the edited volume *Sign Languages in Contact* provides a lucid overview of research on contact both between signed and spoken languages (including their written instantiations) and among signed languages.[2] As he explains, researchers have identified several ways that contact between signed and spoken/written languages manifest in the former—my focus here—such as the appearance of spoken language grammatical features in certain varieties of signed languages, mouthing words while signing, fingerspelling, and 'loan signs' (fingerspelled words with the properties of lexical signs).

During months of fieldwork and language study with deaf Nepalis, I have observed that in some situations or when using certain varieties, signers incorporate Nepali grammatical features, mouth Nepali words, and use the NSL manual alphabet to spell Nepali words (see Green 2002).[3] Indeed, Hoffmann-Dilloway (2008) writes that hearing teachers of the deaf 'perform standard lexical items in a way that follows … spoken Nepali' (193), while deaf teachers in deaf organizations sign 'in a manner that is grammatically distinct from spoken Nepali' (ibid) and that 'takes advantage of spatial grammar' (204).[4] In addition, I propose that NSL evidences what I call 'semantic isomorphism' with Nepali, by which I mean a one-to-one mapping of lexical items in a bounded semantic domain.

Although later in this paper I bring into question the concept of 'borrowing', a traditional analysis of the data would undoubtedly assume that NSL borrowed these items from Nepali, given the languages' socio-historical relationship, briefly detailed below. This claim is not only of potential interest to sign language linguistics, it also bears upon supposedly universal patterns in language contact phenomena. Winford (2003) outlines some of these patterns as a series of implicational constraints, stating that there can be '[n]o structural borrowing without lexical borrowing' (54). In Winford's scheme, phonological, morphological, and syntactic elements are considered structural, while lexical borrowing encompasses borrowing a semantic unit as well as borrowing a phonological form (45). His analysis leaves open the question of whether semantics itself – how a language organizes and expresses meanings – should be considered structural or lexical, a point to which I will return in the final section.

2. Languages

Woodward (1993) places Nepali Sign Language in a South Asian sign language family along with Indo-Pakistani Sign Language (see also Zeshan 2003). According to community narratives, NSL has emerged in the last 40 or so years, following the establishment in 1966 of a then-oral school for the deaf in

[2] See Boyes Braem and Sutton-Spence (2001), Kegl et al. (1999), Nadolske and Rosenstock (2007), Newport (1999), and Woll (1990), and sources cited in Quinto-Pozos (2007).

[3] Some signers also use the international alphabet (identical to ASL's except for the letter 't') for English words. To the best of my knowledge, NSL does not have 'loan signs.'

[4] Hoffmann-Dilloway's research (Hoffmann 2008 and Hoffmann-Dilloway 2008) examines important linguistic and meta-semiotic aspects of the Nepali-NSL interface. I hope to engage more substantially with this work in the future.

Kathmandu (it now follows a policy of 'total communication').[5] Since at least the 1990s, deaf Nepalis have spearheaded efforts at both NSL standardization and outreach (see Green 2007b; Hoffmann-Dilloway 2008), and the Nepal National Federation of the Deaf and Hard of Hearing (NFDH) and the government's 2001 population report claim that there are more than 5000 Nepali Sign Language users.[6] Nepali, meanwhile, is a member of the Eastern Pahari family of Indo-Aryan languages. Like its relatives Hindi and Maithili, both spoken in the southern part of Nepal, Nepali is a descendant of Sanskrit. Spoken as a first language by about half of all Nepalis, it is Nepal's official language and the major lingua franca throughout much of the country.

While in the case of most language contact situations (with the obvious exception of new languages like pidgins and creoles) it is possible, at least in theory, to identify what the languages were like 'before contact', NSL emerged in a society already inhabited by Nepali (and other languages). NSL users not only encounter Nepali through speech (intelligible to deaf people in varying degrees) but also through written Nepali and Nepali-dominant signing, whether produced by deaf or hearing people. These three modalities are present in a variety of sites and interactional contexts, including deaf and hearing schools, deaf organizations, vocational training programs, the workplace, the neighborhood, and the home.

3. Data and Results

In order to ground the complex phenomenon of NSL-Nepali contact in a relatively bounded field, I turn here to the set of kinship terms given by the NFDH *Nepali Sign Language Dictionary,* illustrated by the deaf artist Pratigya Shakya. As John Haviland (p.c.) points out, dictionaries are a questionable source for data on actual language use. Indeed, Philip Waters characterizes this particular dictionary as a 'mixed descriptive and prescriptive' document.[7] Given these methodological and empirical observations, I propose that the dictionary nevertheless represents important conceptions of and claims about the relationship between NSL and Nepali, a point to which I return in the final section.

Each entry in the dictionary includes a drawing of the sign's execution and a Nepali gloss.[8] Of the 60 entries listed in the section on kinship, I analyzed 56,[9] and found a one-to-one mapping between NSL signs and Nepali words. In nearly all cases, one NSL sign corresponds to exactly one Nepali word, and the sign and the word are co-referential.[10] Therefore the relationships among the signs, in NSL,

[5] 'Oral' education refers to teaching deaf students to use and understand spoken language to the exclusion of signed language, while total communication includes both signed and spoken practices.

[6] Like other official statistics on language use in Nepal, this one is of questionable precision, but its mere existence, along with published NSL dictionaries, helps to establish deaf signers as a linguistic minority (see Green 2007a, Hoffmann 2008).

[7] http://www.himalayanlanguages.org/?q=team/philip_waters

[8] Each entry also has an English translation, which I do not consider here, but see Green (2007a).

[9] I left out 'relatives', 'family', 'old man' and 'old woman': not, strictly speaking, kinship terms.

[10] The sign 'baby/young child' is provided with three Nepali glosses, one each gender-neutral,

and among the words, in Nepali, are also identical. In this sense the two kinship systems are isomorphic on the level of both the item and the system.

At first glance, this may appear trivial or inevitable, but isomorphic kinship systems are not universal among spoken and signed languages that are used in the same country or region. For example, Adamarobe Sign Language makes fewer lexical distinctions among kinship relations than does Akan (Nyst 2007), while ASL makes one more distinction than English. Massone and Johnson (1991) propose that Argentine Sign Language employs fewer distinct kinship terms than the Spanish that surrounds it because deaf Argentines are less embedded socially in their (biological) kin networks. My preliminary fieldwork strongly suggests that despite language barriers, social prejudices, and an ever-growing deaf-oriented social network, deaf NSL users are strongly connected to their biological kin networks. For example, while deaf-deaf marriages, including across caste and ethnic lines, seem to be increasing, deaf couples, like other Nepali couples, usually reside with the husband's natal family.

Given that the phonological systems of NSL and Nepali are almost definitionally incompatible, it is of no little interest to consider the formal means through which each language expresses items of and relations within the isomorphic systems. Like all human languages, NSL and Nepali both exhibit arbitrary form-meaning pairings. In addition, the domain of kinship in Nepali is characterized by semi-regular gender marking and extensive sound parallelism between semantically related sets of terms. In NSL, we find highly regular gender marking, visual parallelism, iconicity, and initialization. The examples that follow show how NSL uses both modality-generic and modality-specific strategies to preserve or even emphasize the semantic, and sometimes formal, oppositions and affinities encoded in the Nepali terms.

In example (1), the NSL signs and Nepali words for 'father' and 'mother' are given.[11] The parts of the signs labeled with the numeral '1' correspond to the morphemes for 'male' and 'female', while the parts labeled '2' are a bound morpheme meaning 'parent'. The Nepali words are mono-morphemic, and the NSL signs bi-morphemic, but we can see that the NSL signs, like the Nepali, exhibit formal parallelism. In Nepali, the two words are nearly identical except for the sounds /b/ and /(a)m/ which arbitrarily signify the parent's gender, while in NSL the signs' second morpheme is identical.

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male-specific, and female-specific, but the NSL gender-marking system can easily combine a gendered marking with 'baby' to produce gender-specific meanings. Several signs are glossed with more than one Nepali equivalent, but the given Nepali words are alternate names for the same kin relationship (much like the English 'grandma', 'grandmother', 'granny'); similarly, the dictionary lists two signs and one Nepali word that mean 'daughter.'

[11] The pictures are from the NFDH dictionary; the first line of text is a morphemic gloss of the NSL; the second is the Nepali gloss in Devanagari script; the third is a spelling-based/ phonological transliteration of the Nepali (since most signers are more familiar with written Nepali than with phonetically detailed speech). The fourth line gives either an English translation or a morphemic gloss of the Nepali; if the latter, then the fifth line gives the English translation of both word and sign.

(1)

male-parent
बा/बुवा
baa/buwaa
'father'

female-parent
आमा/मुवा
aamaa/muwaa
'mother'

Of the 56 NSL terms included in this study, 54 of them overtly mark gender, and of these, the gender morpheme occurs first in 50, as in the example above. With the exception of the sign 'daughter', which has an alternate form substituting the sign 'girl' for the sign 'female', all 54 gender-marked signs use the gender morphemes shown in example (1). These signs, which also function as unbound morphemes, are examples of metonymic iconicity. The sign 'male' represents a mustache and the sign 'female' represents the nose ring worn by women from some of Nepal's caste and ethnic groups. According to Wilkinson (2008), gender metonymy is common in sign language kinship systems. The NSL pattern of marking gender initially and with a non-simultaneously articulated, unbound morpheme is thus unusual, at least in relation to Wilkinson's cross-linguistic data.

In contrast to NSL, Nepali uses several different ways to mark gender. The most common, occurring in 15 pairs of words, places the morpheme *-i* (or one of its allomorphs *-ni, -ani*) word-finally, sometimes replacing the final vowel of the male-gendered word. Examples include *naati* 'grandson' and *naatini* 'granddaughter', as well as *kaakaa* 'father's younger brother' and *kaaki* 'wife of father's younger brother'. Other related pairs use a bound, gender-neutral honorific morpheme on either the male or the female. Consider *phupaajyu*[12] 'husband of father's sister' and *phupu* 'father's sister', but *maamaa* 'mother's brother' and *maaijyu* 'wife of mother's brother.' There are also terms such as *sasuraa* 'father-in-law' and *saasu* 'mother-in-law' that use sound parallelism to mark the semantic relationship, and sound difference (but not an identifiable morpheme) to mark gender. Due to these variations, it is difficult for me to say how many Nepali terms formally mark gender, but the number appears to be close or equal to the NSL number. Thus in terms of gender marking, NSL differs from the Nepali primarily in the position of the gender marker and in the former's use of metonymic iconicity.

It is now worth returning to those NSL signs in which gender is *not* marked sign-initially. Example (2) shows two of the four signs. The first morphemes, labeled with the numerals 1 and 2, are articulated with a closed hand opening up, that is, getting larger. The second and third morphemes, labeled 3 and 4 (the Nepali '4' looks like an

[12] Following one of several semi-standard orthographic systems for transliterating Nepali, a consonant followed by the letter 'h' represents a single aspirated phoneme.

upside-down ribbon), are 'male' or 'female' and 'parent'. These signs literally translate as 'big father' and 'big mother', exact calques of the literal Nepali meanings.

(2)

male-parent-big
ठूला बा
Thulaa baa[13] (lit. 'big father')
'father's older brother'

female-parent-big
ठूली आमा
Thuli aamaa (lit. 'big mother')
'father's older brother's wife'

Nepali also has a pair of words that literally translate as 'small father' and 'small mother', which NSL also calques. These four signs are the only ones that include the gender morpheme in non-initial position, which renders the calque exact. These are also the only Nepali kin terms that include a word from another semantic domain (size), and, perhaps not coincidentally, this domain is easily represented visually.

In addition to gender, absolute age, relative age and status are also encoded iconically in NSL. Example (3) demonstrates how the NSL signs for 'grandfather' and 'grandmother' express old age as central to the concept of 'grandparent', with the bent shape of the index finger representing the posture of an old man or woman. Indeed, the signs for 'old man' and 'grandfather' and 'old woman' and 'grandmother' are essentially identical[14] (the Nepali words are not). In the Nepali alternatives, 'old age' is either implicit in the spoken forms as part of the semantics, or indirectly expressed with the honorific *hajur*, which is applied to people with high status, often associated with old age.

(3)

male-old.person
बाजे/हजुरबा
baaje/hajur.baa
'grandfather'

female-old.person
बज्यै/हजुरआमा
bajyai/hajur.aamaa
'grandmother'

[13] Capital letters represent retroflex consonants; followed by 'h' they represent retroflex aspirated.
[14] To illustrate this, I have used the drawing for the sign 'old man' on the left and the drawing for the sign 'grandmother' on the right. The dotted lines in the former show that the signer also hunches the shoulders; this sign is a real-space blend in which shoulders and index finger both represent an old man's posture, but in different scales (see Dudis 2004). It remains to be studied whether hunching is obligatory for and exclusive to the sign 'old person'.

In (4), relative age is also represented iconically. The Nepali *jeThaa* 'eldest male sibling' and *jeThi* 'eldest female sibling' are two of the widely used Nepali dyads that identify the age rank of one's children, brothers and sisters, acquaintances, or self, in relation to siblings of the same sex. While in Nepali the age rank is a semantic, but not formal, dimension, in NSL age rank is formally expressed with a separate morpheme.

(4)

male-first
जेठा
jeThaa
'eldest male sibling'

female-first
जेठी
jeThi
'oldest female sibling'

The rest of the semantic set – 'second oldest male sibling', 'second oldest female sibling', etc. – follow this formal pattern. For 'second', 'third', and 'fourth', the appropriate number of fingers (including the thumb) extend on the non-dominant hand and the dominant hand grasps the non-dominant hand's relevant finger (the second, third, or fourth, counting down from the thumb). The sign for the 'youngest' is made similarly to the sign in example (4) but with only pinky finger extended and the hand moving downwards. This setting-off of the 'eldest' and 'youngest' terms from the rest also exhibits formal parallelism with the Nepali. The Nepali words for the second, third, and fourth oldest male and female siblings rhyme (*maailo, maaili; saailo, saaili; kaailo, kaaili*[15]) while the words for the youngest ones (*kaanchha, kaanchhi*), like the words for the oldest, are distinct.

Relative age-rank is also encoded by the terms for brother and sister, of which there are four in both Nepali and NSL, as shown in (5).[16] This table shows that there are two axes of opposition, gender and relative age. For Nepali, gendered pairs are linked through word endings: *-i* for female and *-aai* for male. Age pairs are linked through their initial sounds. The older sibling terms *didi* 'older sister' and *daai* 'older brother' start with the same consonant. The younger sibling terms *bahini* 'younger sister' and *bhaai* 'younger brother', on the other hand, begin with different phonemes (and letters), but as the transliteration indicates, the sounds are phonetically similar and much more similar to each other than either is to the sound with which *didi* and *daai* begin.

[15] The initial diphthongs in *saailo, saaili, kaailo,* and *kaaili* are nasalized, but this does not diminish the strong sound parallel with *maailo, maaili*.

[16] In practice NSL users commonly combine the two systems to list siblings by touching in descending order the fingers of the non-dominant hand and signing *daai* 'elder brother', *didi* 'elder sister,' *bhaai* 'younger brother' or *bahini* 'younger sister' in turn to demonstrate whether each sibling is male or female as well as older or younger in relation to the signer.

(5)

Nepali and NSL Siblings	Female	Male
Younger	बहिनी *bahini*	भाइ *bhaai*
Older	दिदी *didi*	दाई *daai*

In NSL, meanwhile, the gendered pairs are linked through the initial morpheme, while the age pairs are linked through the final morpheme. The final morpheme is an iconic representation of height, metaphorically standing in for relative age. Thus the NSL terms preserve both the gender and age pairings of the Nepali, emphasizing the latter through metaphoric iconicity.

As mentioned previously, age in Nepal(i) is closely linked with status. In Nepali, status is nearly always an implicit semantic aspect of the kinship term, except in cases like example (3) that incorporate an honorific. In NSL, status is rendered visible through the location of the hands, as shown in (6).[17]

(6)

female-SA
सासु
saasu
'mother-in-law'

female-BHA
भाउजू
bhaauju
'older brother's wife'

male-parent-old.person-old.person
जिजुबा
jijubaa
'great-grandfather'

female-SA
साली
saali
'wife's younger sister'

male-BHA
भान्जा
bhaanjaa
'sister's son'

male-JA
ज्वाई
jwaai
'younger sister's husband'

[17] SA, BHA, and JA are examples of initialization, discussed shortly.

The first row of signs are higher in status than ego, while the second row are lower in status than ego. For each, the status corresponds to the height or location of the second morpheme. This height is not gradient, but categorical. That is to say, the sign for 'father-in-law', at least as drawn here, articulates the second morpheme at a lower level than does the sign for 'older brother's wife.' This does not mean that the former has lower status than the latter in relation to ego. Rather, signs articulated above the shoulder line are high status, and those at the chest level are low status. The first sign from each row together demonstrate that the height/location distinguishes members of a minimal pair.

Now let me turn to another way that NSL links signs both to each other and to Nepali, shown in (6) and more fully demonstrated in (7). A subset of NSL kin terms employ alphabetic characters from the NSL manual alphabet, which is based on the Nepali writing system. Initialization is a common, though not universal, phenomenon in sign language kinship terms (Wilkinson 2008).

(7)

male-DA
देवर
dewar
'husband's younger brother'

female-DA
देवरानी
dewaraani
'husband's sister'

In (7), the Nepali pair of terms is linked through sound, the morpheme *dewar* being present in both words. In NSL, the pair is linked through the second morpheme, which is the manual sign for the character द (da).[18] Like the exact calque in example (2), but even more explicitly, initialization uses language-specific resources (here, the manual alphabet) to reference another language. One need not know Nepali to understand the meanings of initialized terms, yet the use of fingerspelling in other contexts continually reinforces the relationship between the NSL and Nepali terms. As elsewhere, we also see that NSL preserves both the gender distinction and the formal parallel present in the Nepali dyad.

Out of 56 total terms, 22 use initialization. In addition there are two signs that I had tentatively analyzed as a case of productive but 'faux' initialization. These signs – *phupajyu* 'father's sister's husband' and *phupu* 'father's sister' – look similar in form to the 22 real initialized signs, but the manual alphabet character used, ण (na) does not correspond to the Nepali words, which begin with फ (pha). Ulrike Zeshan (p.c.) points out that these two signs are formally and semantically

[18] In Nepali script, the consonants 'come with' a vowel, transliterated as a single [a]. Thus the manual alphabet character [द] (da) that NSL uses for *dewar* does not correspond exactly to the written form [दे] (de). John Sylak (p.c.) suggests that we think of this as phonological reduction.

identical to ones in IPSL. She also observes that there are other kin term cognates in NSL and IPSL. This raises important questions regarding the historical development of South Asian sign languages, intra-modal sign language contact, and the meta-pragmatics of language contact. The first two are beyond the scope of this paper, while the last is a point I raised above and to which I return below.

4. Conclusion and Discussion

Despite incompatible phonological systems, the NSL kinship system is isomorphic with that of Nepali. Nepali and NSL both express individual items and relations between items using modality-generic resources such as arbitrary form-meaning mapping and gender-marking. Nepali uses the modality-specific resource of sound parallels. Meanwhile, NSL makes use of modality-specific resources such as visual iconicity (including metaphoric iconicity) and initialization to produce and even emphasize semantic connections and oppositions, as well as to maintain some of the formal relationships present in the Nepali.

The data and my analysis of it lead to several possible conclusions. First, in accordance with Winford's proposed universal implicational restraints, we note that the set of semantic calques discussed in example (2) constitutes an instance of lexical borrowing. As mentioned earlier, Winford does not address whether what I have called semantic isomorphism should be counted as lexical or structural borrowing. I argue here that the one-to-one mapping of Nepali and NSL kinship terms is indeed structural, since the inter-relations of kinship terms are systematic in the same sense that phonological, morphological, and syntactic patterns are systematic.[19] At the same time, my focus on kinship raises the question of whether implicational constraints must be assessed from the point of an 'entire' language or whether they might also hold within restricted semantic domains. If we consider only the restricted domain, it becomes critical that in the NSL-Nepali case, the presence of the semantic calques appears entirely incidental to the borrowing of the kinship system itself, especially when we remember that the only Nepali terms calqued are those that include morphemes from the domain of size. Since the analytic force of implicational constraints assumes that the patterns they capture are not epiphenomenal, this raises the possibility that Winford's constraints might not be universally applicable. More broadly, my paper suggests the importance of further research on inter-modal language contact and of the incorporation of signed-signed and signed-spoken language contact data into formulations of language universals. It also demonstrates the potential productivity of investigating how languages in contact draw on each others' systems of meaning. It would be interesting, for example, to examine how semantic structure interacts with more 'traditional' categories of linguistic structure in the realm of language contact phenomena.

A second different set of conclusions arises if we consider more carefully the sociological aspects of NSL and Nepali contact. NSL arose in a milieu saturated

[19] This point has been observed and explored by the great structuralists of the early 20th century.

with spoken and written Nepali, and NSL's first and subsequent users – however we understand the always problematic nature of the language's 'origins' – developed their language as members, albeit marginalized ones, of the broader society. In this sense it would be inaccurate to say that NSL 'borrowed' the kinship distinctions encoded by Nepali, even though the former in some sense reproduces the latter. Extrapolating from this point, it seems that, as with other aspects of linguistic theory, research on deaf societies and signed languages asks us to refine and reformulate the concept of language contact, and forces us to pay ever closer attention to the interplay between social processes and linguistic structure.

Finally, following the tradition of meta-pragmatic research that can be traced to Silverstein (1976) among other seminal works, this paper illustrates that in conceptualizing the relationships between languages, people are as interested in sociality as in what linguists would call historical or linguistic relationships. That is to say, what the creators of the NSL dictionary found relevant was how NSL and Nepali map onto each other, and not, for example, the relationship between NSL and IPSL or NSL and any other of Nepal's spoken languages. Indeed the dictionary itself – not only encountered as a visible icon of the deaf social movement in Nepal but also found, dog-eared and worn, in so many deaf people's homes – and especially its representation of the domain of kinship present a particular vision of NSL, and likewise its users, as members of the Nepali family.

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Influences of Linguistic and Non-Linguistic Factors in the Processing of American Sign Language: Evidence from Handshape Monitoring*

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0. Introduction

Signed languages used in Deaf communities are naturally occurring human languages. Despite the differences in language form, signed languages have formal linguistic properties like those found in spoken languages (Stokoe 1960, Klima and Bellugi 1979, Sandler and Lillo-Martin 2006). However, only a few psycholinguistic studies of on-line processing in signed languages exist (for reviews of psycholinguistic studies of ASL see Emmorey 2002, Corina and Knapp 2006), and only a subset of these have directly addressed lexical recognition.

Studies of lexical recognition in signed languages have provided evidence for well-known psycholinguistic properties such as lexicality, usage frequency, and semantic and form-based context effects (Corina and Emmorey 1993, Mayberry and Witcher 2005, Dye and Shih 2006, Carreiras et al. 2008). However, a fuller explication of the processes by which a gestural-manual sign form is mapped to a meaningful lexical representation remains to be determined. A prominent issue is to determine whether the processes involved in sign recognition are driven by factors that are common to human action recognition in general or entail specialized linguistic processing. The present experiment investigates perceptual, motor and linguistic factors of sign recognition in the context of a sub-lexical monitoring task.

0.1. Phoneme Monitoring

Phoneme monitoring experiments are a staple of the spoken-language psycholinguistic literature (for a review see Connine and Titone 1996) and this technique has been useful in helping determine the relative importance of autonomous (bottom-up) versus interactive (top-down) processes in language comprehension. Though results are not always consistent, researchers have generally found faster

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reaction times for phoneme monitoring in the context of words rather than non-words (e.g., Cutler et al. 1987, Eimas, Hornstein, and Payton 1990, Pitt and Samuel 1995), supporting the idea that top-down influences are relevant even in the processing of sub-lexical linguistic elements.

In the present study, subjects were asked to respond when seeing a sign form articulated with a particular handshape. The viewed actions were either real ASL signs or phonologically possible "non-signs." Based on the results from spoken-language studies, one would expect to find faster RTs in the sign context than in the non-sign context and additionally, such an effect would only be expected in subjects able to tell the difference (i.e. signers). Though the paradigm used here has clear parallels with spoken-language phoneme-monitoring tasks, it must be noted that phonemes and sign parameters like handshape are not necessarily same-level units; in fact, the proper analogue of the phoneme in sign language is not a settled question. Spoken-language studies have found that monitoring RTs are slower, respectively, for phonemes, syllables, and words (Foss and Swinney 1973, Savin and Bever 1970, Segui et al. 1981), but the position of sign parameters like handshape in such a hierarchy is as yet unclear.

0.2. Lexicality

In the psycholinguistic literature, investigations of lexicality have examined how the word-form influences a subject's decisions when he or she is asked to recognize or determine a true word as opposed to a "non-word" (a form which by definition was made up by the experimenter and has no lexical entry). The assumption is that our ability to recognize a word is aided by its prior mental representation. A common finding is that the more word-like a non-word stimulus is, the harder it is to determine whether it is a true word or a made-up form. The fact that pseudo-words like "nust" are more difficult to reject than phonotactically impossible word-forms like "ntpw" is thought to be due to sub-lexical components of these stimuli forms engendering partial activations of existing mental representations, ultimately leading to more difficult correct rejections (Forster and Chambers 1973, Forster 1976, Coltheart et al. 1977, Gough and Cosky 1977).

In the present experiment, we created phonotactically possible non-signs by altering one parameter of well-formed existing signs. While several studies have reported lexicality effects in the context of lexical decision experiments for signs, whether such forms would be capable of engendering lexicality effects in the context of a handshape monitoring task is unknown. If such effects are found, it would argue for automatic top-down processing during sign recognition.

0.3. Markedness

The notion of markedness in phonological theory dates from the time of the Prague School, in particular the work of Trubetzkoy (1939/69) and Jakobson (1941/68). The term is generally used to indicate that the values of a phonological feature or parameter are in some sense patterned asymmetrically, in that one value may be realized with more natural, frequent, or simple forms than those of the

other. The properties Jakobson (1941/1968) associated with unmarked elements included cross-linguistic frequency, ease of production and acquisition, and resistance to loss in aphasia. Within a specific language, "markedness" is often considered a synchronic property of the grammar; however, extra-linguistic factors such as those just mentioned point to interplay between performance factors and grammaticization. We know of no studies that have examined processing efficiency as a function of markedness. Indeed, a priori it is difficult to predict the direction of the effects of markedness.

Within the literature on sign language phonology, some researchers have sought to distinguish marked and unmarked handshapes, based either on general notions of markedness like those mentioned above, or on others specific to sign language, such as the behavior of the non-dominant hand. Battison (1978) argues for a limited set of unmarked handshapes (B, A, S, C, O, 1 and 5), based on properties such as distinctiveness, frequency in ASL and other sign languages, and weaker restrictions on their occurrence, relative to other handshapes.

0.4. Type

In addition to the linguistically-based factor of lexicality and handshape markedness, stimuli could also be classified according to the perceptual factor of Type, where a sign or non-sign is either Type 1 (involving the dominant hand only), Type 2 (two-handed signs with symmetry in handshape and movement between the hands), or Type 3 (two-handed asymmetrically formed signs).[1] Notice that while Markedness is a factor defined with respect to a particular linguistic system, the Type of a sign or non-sign is defined in terms which are purely visual. Therefore, one might expect both deaf and hearing subjects to show effects related to Type but only deaf subjects to be sensitive to Markedness.

0.5. Motor Involvement During Perception

Researchers have found that visual images of hands may facilitate grasping or finger actions when there is congruency between the image and the final hand or finger posture (Craighero et al. 1999, 2002, Brass et al. 2000, Vogt, Taylor and Hopkins 2003). Contrariwise, Miall et al. (2006) reported faster discrimination times for visual target discrimination of hands in the context of congruent hand actions (cf. Schütz-Bosbach and Prinz 2007). Whether such effects might be found in manual language perception is as yet unknown. The handshape-monitoring paradigm used in the present study enabled us to investigate this issue.

In this experiment, subjects were asked to monitor for non-changing ASL handshapes under two conditions: 1) while overtly shaping their dominant hand in the shape of the target (the "congruent" condition), and 2) while shaping their dominant hand in a different shape from the target. If congruency between motor action and perception has an influence here similar to what has been seen in the

[1] Our use of Type as a perceptual factor should be distinguished from Battison's use of Type in his study of sign language phonotactics.

aforementioned studies, it would be expected to manifest itself as faster RTs in the congruent condition. Since the task is not strictly language-dependent, such effects might be expected in both the deaf and hearing subjects. A very interesting question is whether the knowledge of the language and/or the linguistic status of the stimuli might influence such motor-perceptual interactions.

1. Methodology

1.1. Subjects

A total of 45 participants took part, of whom 25 were deaf (17 female) and 20 were hearing (12 female). Four subjects (all deaf) were left-handed. Of the deaf subjects, 10 were native signers, having learned ASL from infancy, and 15 were late learners, having acquired ASL in elementary school or later. All of the deaf subjects were students at Gallaudet University, while the majority of the hearing subjects were undergraduate students at UC Davis. Subjects were given either course credit or a small fee for participating; all gave informed consent.

1.2. Stimuli

Each subject viewed a sequence of short video clips showing a person performing an action, which could either be an ASL sign or a "non-sign" formed by changing the handshape of an actual sign. The action shown in each clip was performed by one of two deaf performers, one of whom was male and the other female. Clips were normalized to a length of 1034 ms. The distance from subject eye to the computer screen on which the stimuli were presented was 24 inches. A total of 180 manual actions (90 signs and 90 non-signs) appeared in these clips, of which a third were the main object of study in this experiment ("target" clips) and the rest fillers. Overall, the set of clips was designed to be balanced in terms of sign frequency (see below for additional discussion). Each video clip was shown once.

Handshapes classified by Battison (1978) as unmarked that were used in this study were "S," "5" and "A," while the set of marked handshapes consisted of "F," "I" and "V." During congruent trials, subjects held their dominant hand in the same configuration as the intended target. For incongruent trials, subjects held an alternative non-target handshape that nonetheless shared some formational similarity with the target. In each case the non-congruent handshapes utilized finger specifications that were present in the target form. For example, while monitoring for the "V" handshape, in which the index and middle finger are outstretched, the incongruent handshape was an "R" handshape, which also involves the index and middle finger, but with a crossed configuration.

1.3. Task

The task consisted of 12 blocks of 15 clips each, with random ordering within blocks. The duration of the task for each subject was approximately 8 minutes. The subject was told that she would be watching a series of short video clips and that her task was to decide as quickly as possible whether or not the gesture shown in the clip was formed using a particular handshape, and if it was, to

respond by pressing a button on a response device using her non-dominant hand. At the same time, the subject had to hold a particular handshape on her dominant hand. Instructions telling the subject which handshape to hold and which handshape to respond to were given at the start of each block. The handshapes being monitored for and held by the subject were the same (congruent) in half of the trial blocks. Hearing non-signers were explicitly shown each handshape at the start of each trial block. The ISI was approximately 350 ms.

2. Results

2.1. Perceptual and Motor Factors

Overall, deaf signers were faster (mean RTs for deaf = 665 ms and for hearing = 764 ms; $t(41.4)=5.03$, $p<0.001$) than hearing subjects. While this is not particularly surprising, it indicates that these data do not exhibit a speed-accuracy tradeoff, as hearing subjects were both slower and less accurate than deaf subjects.

2.1.1. Effects of Type

Significant effects of Type were found for both hearing and deaf groups. For both groups, the pattern was similar, with Types 1 and 2 associated with similar RTs and Type 3 RTs significantly slower (Type 1 vs. Type 2: $t(44)=0.23$, ns; Type 2 vs. Type 3: $t(44)=6.64$, $p<0.001$; Type 1 vs. Type 3: $t(44)=7.62$, $p<0.001$).

For hearing subjects compared to deaf subjects, RTs to Type 3 stimuli were substantially slower. This indicates that while Type 3 stimuli were the most difficult of the three action types for both groups, the hearing subjects found it more challenging to separate out the useful information (the target handshape, seen only on the dominant hand for Type 3 actions) from the distracting information (the non-dominant hand's handshape). Indeed, when asked about their responses to Type 3 stimuli, most deaf subjects said that they had ignored the non-dominant hand altogether, even though that hand is formed in some particular handshape in any two-handed sign. If this were shown to hold for signers more generally, it might support the suggestion that has been made (e.g. Sandler and Lillo-Martin 2006) that the non-dominant hand serves as a place of articulation in such signs rather than as an articulator in its own right.

One might have expected that Type 2 sign-forms (in which both the dominant and non-dominant hands are formed into the target handshape) might be responded to faster than Type 1 forms, in which only one target handshape is evident. While the hearing subject means for Type 2 versus Type 1 stimuli were numerically in the expected direction, the magnitude of this effect was not statistically significant. This may indicate that subjects were attuned to the dominant hand of the sign models. However, the data from Type 3 actions indicate that a non-dominant hand with a non-target handshape did influence RT. This was especially true for the non-signers. Taken together, these data indicate that perceptual factors (the sheer differences in the amount of handshape information to monitor) drive these effects to a substantial degree, but the interaction with

Group suggests that language-specific knowledge also modulates the magnitude of these frank perceptual differences.

2.1.2. Motor-Concurrent Effects

In this task, while subjects were monitoring for target handshapes, they were instructed to configure their *own* dominant hand in a congruent or incongruent handshape (i.e., the same as or different from the monitored-for handshape, respectively). During this procedure, subjects rested their elbow on the table while they held the required handshape. In principle, subjects could benefit from a myriad of factors, including motor, somatosensory, visual, as well as memory effects during the target detection task. Unexpectedly, we observed no effects of motor congruency in these data.

While a growing number of studies have reported such effects, it is difficult to directly compare many of them, as procedures and assumptions vary widely (see Schütz-Bosbach and Prinz 2007 for a recent discussion). One clear difference is the fact that in our task, subjects were not asked to re-articulate the handshape for every target; that is, once they assumed an instructed handshape posture, they maintained this during an entire block of trials. In a study of working memory for signed language by Wilson and Emmorey (1997), the researchers reported a phonological suppression effect during a sign language working-memory task in which the subject had to continually re-articulate handshape posture. In a study by Miall et al. (2006) in which congruency effects were obtained in the context of an oddball detection task, subjects alternated between two hand configurations approximately every 4 seconds, while performing the handshape-oddball detection task (specifically, detecting a handshape that was not congruent with the articulated handshape). To the extent that the re-articulation of the articulatory configuration is a critical variable, it would suggest that the interplay between perceptual and action representation does indeed find a common code within the motor domain rather than a representation deduced from a somatosensory-postural code.

2.2. Linguistic Effects

2.2.1. Lexicality

Subjects were collectively faster at detecting handshapes in signs compared to non-signs (for signs, mean RT = 697 ms; for non-signs, mean RT = 717 ms). This reaction time difference was significant only for deaf subjects [654 vs. 677 ms, $t(24)=2.23$, $p<0.05$; for hearing subjects [755 vs. 772 ms; $t(19)=2.04$, ns]. These data indicate that handshape monitoring in a sign language evokes linguistic representations of lexical forms. As with spoken languages, these lexicality effects indicate a top-down influence of the lexical content during the detection of handshape information in signs in persons familiar with signed languages.

2.2.2. Effects of Markedness

Deaf subjects were consistently *faster* at detecting marked handshapes than unmarked handshapes [656 vs. 674 ms, $t(24)=2.71$, $p<0.05$], while hearing subjects showed no significant difference [768 vs. 759 ms, $t(19)=0.76$, ns]. Examination of errors shows that deaf subjects maintained highly accurate responses to both marked and unmarked handshapes (for marked and unmarked HSs, mean accuracy = 98.5 and 98.4% [$t(24)=0.19$, $p=0.85$]), while hearing subjects made more errors responding to items with marked handshapes (mean accuracy = 94.8% vs. 88.7% [$t(19)=2.54$, $p<0.05$]). These findings suggest that marked handshapes such as "F," "I" and "V," compared to unmarked forms such as "S," "5" and "A," may provide more distinct targets for individuals who know the formal sign system. Hearing individuals without tacit knowledge of the formal properties of sign inventories do not show such RT benefits and show poorer performance in the detection of these more complex forms.

3. General Discussion

3.1. Overview

Several important findings emerge from these data. Notably these data indicate that the task of handshape monitoring in single-sign targets is sensitive to processes observed in studies of phoneme monitoring in spoken languages. In addition, we have been successful in evaluating perceptual and linguistic factors that influence the sign recognition process.

The fact that deaf subjects were faster overall is unsurprising in light of their greater experience processing this kind of visual information. Similarly, the finding of faster RTs for deaf subjects to signs than to non-signs is consistent with previous work on phoneme-monitoring tasks in spoken language, which has tended to find that responses in the context of lexical items are faster than those for non-lexical items (e.g. Cutler et al. 1987, Eimas et al. 1990). The absence of such a lexically-driven effect in the hearing non-signers is again not surprising, since these subjects should have no way of knowing which stimuli showed lexical items (cf. Cutler et al. 1987, who found that English speakers showed no lexical effects when performing a phoneme monitoring task on French stimuli).

Overall we observed that the perceptual factor of Type influenced all subjects in a similar fashion, independently of their knowledge of sign language. Specifically, two-handed asymmetrical (Type 3) signs led to slower RTs. This likely reflects the fact that there is a greater amount of distracting information in these forms. The fact that hearing non-signers were significantly slower than deaf signers in this condition does indicate that knowledge of the language may influence this decision process. Note that in the Type 3 asymmetric signs, the target handshape is the dominant and moving hand, while the base hand is static. Some sign linguists have argued that the representational status of base hands in these forms should be treated formally as a "place of articulation," rather as a handshape per se (for discussion, see Sandler and Lillo-Martin 2006). The present data suggest that deaf users of sign language are more quickly able to discount

this static handshape as not relevant for the handshape detection task. It is of further interest that this factor of Type does not interact with the AoA variable. Thus this tacit knowledge of the asymmetrical role of handshapes is acquired by even late learners of signed language.

3.2. Lack of Strong Effects of Congruency

Previous work by Wilson and Emmorey (1997) successfully used repeated changes of handshape to induce phonological suppression in memory tasks of ASL. We believed that by configuring the subject's handshape into particular handshapes, we might induce faster recognition by the subject for congruent target handshapes than to incongruent ones. This would suggest that postural control of one's own body can have processing consequences for visual recognition, consistent with proposals of a motor-visual link (Craighero et al. 2002). Furthermore, since performance of this task is not dependent on knowledge of the linguistic system of ASL, congruency-related effects might have been expected in both the deaf signer and hearing non-signer groups. In fact, no significant effects of Congruency were found overall, in either group of subjects.

One possible explanation for the absence of such effects lies in the frequency with which subjects had to articulate a new handshape. Recall that subjects held one handshape during an entire block of 15 video clips, then changed to a different handshape during the next block of 15 clips, and so on, so that the motor action of making a handshape change was required relatively infrequently during the course of the experiment. This suggests that Congruency-related effects might be seen if subjects assumed a new handshape posture more frequently, so that the visual monitoring and motor action tasks were more fully integrated. To explore this possibility, another version of the experiment was run on nine new subjects, all hearing. In this newer version, blocks were five video clips long instead of 15, with articulation of a new handshape required before each of these shorter blocks (i.e. three times as often as in the original task). Still, no significant effects related to Congruency were found. The experience of Wilson and Emmorey (1997) in their ASL study of phonological suppression may be relevant here. The experimenters found that subjects' performance of a memory task was inhibited if subjects were required to perform sign articulations simultaneously, a result consistent with the spoken-language literature. However, Emmorey (p.c.) reports that such effects were not seen in initial versions of the experiment in which the sign forms were not continually re-articulated. Perhaps more substantial Congruency-related effects might be seen in a paradigm similar to the present one, but with much more frequent handshape re-articulation on the part of study participants.

3.3. Issues Related to Markedness

Some of the most striking and important findings in this study concern the effects of handshape Markedness. The absence of a significant effect of Markedness in the hearing group contrasts notably with the Markedness effect we found in the deaf group. Moreover, the significant markedness effects seen in the deaf signers

are limited to the sign stimuli and are not observed for the non-signs. These outcomes give support to claims that markedness reflects a representational property of the sign lexicon.

It is interesting that the deaf subjects' responses to marked items tended to be faster than to unmarked items. Although a Markedness-driven effect in the signing subjects was not unexpected, it was not clear at the outset in which direction such an effect should be expected to work. On the one hand, marked items might stand out and therefore be easier to recognize; on the other, such items might in some sense be more unusual or difficult to deal with, in which case slower RTs might be the outcome. For the deaf subjects who took part in this study, the former is the tendency which prevailed.

This finding raises the important question of whether the markedness effects observed in the present study might in fact be related to other factors such as lexical frequency or neighborhood density. An investigation of this important question is somewhat limited by the lack of published frequency norms for signed languages. While there are clear limitations, we examined a proxy of sign frequency based upon the English translation of the sign stimuli used. The results of this analysis based upon raw counts and log transforms of scores were not significant (for unmarked items, Kucera and Francis (1967) mean frequency f = 351, log(f) = 4.6; for marked items, mean frequency f = 278, log(f) = 4.24; t-test outcome ps = 0.61 and 0.72 respectively). Thus we do not believe that the markedness effects seen for the current stimuli can be attributed to lexical frequency.

An equally interesting question concerns whether there could be neighborhood effects disguised as markedness effects. This is especially important given the results found in the Carreiras et al. (2008) study, which did observe influences of handshape form on two measures of lexical access. In Experiment 2 of Carreiras et al. (2008), subjects made lexical decisions to LSE signs. The stimuli lists were composed for sign forms that varied as a function of lexical familiarity and handshape form, specifically a factor somewhat akin to "neighborhood density." In this case, a phonological neighborhood was defined as a collection of signs that were phonetically similar to a given stimulus sign by virtue of sharing one parameter, handshape. Specifically, a sign whose phonological specification for handshape is shared by many other signs is said to have a large neighborhood, while a sign with a handshape that is not shared by many other signs has a small neighborhood. As might be expected, large neighborhood handshapes tended to be linguistically unmarked forms (B, l, A, and 5), while small neighborhoods were composed of marked forms (L, bO, F, etc.). The main finding from this experiment was that low familiarity signs with a large "handshape neighborhood" (i.e. those with a preponderance of *unmarked* handshapes) were responded to faster and more accurately than those with small neighborhoods (i.e. those with a preponderance of *marked* handshapes). These effects were most pronounced in non-native signers.

In contrast to the Carreiras et al. (2008) study, in the present experiment we observed that signers were faster at detecting signs with *marked* handshapes in the

context of the handshape monitoring task. Though it is difficult to directly compare these differing methodologies, our results are likely not being driven by *neighborhood* effects (as defined above), as we would have expected the opposite effects given the findings of Carreiras et al. Note however, that like the effects reported in Carreiras et al., markedness effects seen in the present experiment were also pronounced in the non-native signers. One possible explanation for the observed differences in the present study from the results of Carreiras et al. may lie in the sources of the effects. Based on the patterns of facilitation of responses in large density neighborhoods (which typically produce slower RT's and lower accuracy in studies of spoken languages (Goldinger et al. 1992, Monsell and Hirsh 1998, Radeau, Morais and Segui 1995, Slowiaczek and Pisoni 1986, Vitevitch 2002) and the results of handshape lexical decision priming (Carreiras et al. 2008, Experiment 4) which indicated that facilitatory priming effects were limited to non-signs sharing similar handshapes, Carreiras et al. (2008) suggest their result may indicate prelexical activation.

In contrast, for deaf subjects in the present study, markedness effects were limited to lexical sign responses. Following this line of reasoning, we cannot fully rule out that our faster response times to marked handshapes may be related to lexical neighborhood effects (as opposed to pre-lexical effects) whereby, on the balance, the signs with marked handshapes may be drawn from more sparse neighborhoods than those with unmarked handshapes. Further work is required to fully tease apart these effects.

4. Conclusion

This is one of the first psycholinguistic demonstrations of an implicit measure (handshape monitoring) being used successfully to explore lexical access in a sign language; moreover, the design of the study permitted an exploration of the roles played by both linguistic and non-linguistic factors in this process. Some of the study outcomes were in line with expectations: deaf subjects were faster at the task than hearing subjects, and for the deaf group only, RTs to signs were faster than to non-signs. Similarly, perceptual effects related to target handshape Type were seen for both deaf and hearing groups, while the linguistic factor of Markedness was associated with significant effects only in the deaf group. In contrast to these results, the lack of significant overall effects of handshape Congruency was somewhat unexpected, in light of previous work on motor-visual facilitation (e.g. Schütz-Bosbach and Prinz 2007). This may be due to the fact that static handshape postures were used rather than a re-articulation of a handshape for each trial. Further work is needed to expand these initial findings.

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Kinesic Components of Multimodal Utterances

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0. Introduction

I begin with a commonplace observation: when people speak they often (although not always) engage in hand and arm movements which, typically, are seen as "part of talking" - these hand movements are often deemed meaningful in some way and are commonly said, for example, to add emphasis to what the speaker is saying or to add to the description of something being talked about. These are normally recognized as movements that are intended to convey some kind of utterance related meaning, and in the ordinary course of our dealings with one another they rarely, if ever, are seen as strange or unintelligible.

Such movements, commonly referred to as "gestures" or "gesticulation", in the last twenty years or so have become the focus of much scientific analysis. This work, especially that done on so-called co-speech gestures, has been driven in large part (so it seems to me) by a great *puzzlement* as to why people engage in them. As I have just suggested, however, this is not a puzzlement that ordinary people in their everyday lives suffer from ('gestures' are quite transparent, I think, for most people). It is a puzzlement that is suffered from by modern psychologists, psycholinguists, and others. This is in part because we have been, at least until recently - and perhaps still are - under the very strong impression that anything we need to say to another, at whatever level of abstraction and complexity it might be, ought all be done in *words* - and we really don't need anything else. If this is so, why use gestures at all? Perhaps, as is sometimes suggested, gestures are only used when ability with words is lacking. For this reason, a negative value has often been attached to them. Sometimes there is even hostility towards gestures - using them indicates a lack of proper self-control as well as a lack of proper mastery of language, their use shows "lack of breeding" and therefore they should be suppressed.

The idea that verbal language is sufficient for all communicative purposes (with the underlying attitude that if it isn't, it ought to be) that remains dominant even today, is quite old, but was reinforced especially, I think, by the rise of mechanized printing technology in the nineteenth century, which finally estab-

lished the *written word*, language in its *written form,* as the ideal to which we, as speakers should all aspire and, indeed, as the most perfect and complete expression in language possible. Some have argued that the course of modern linguistics has been deeply shaped by this (see Harris 1987, Linell 2005). Linguistics, it is suggested, is largely the study of language in its written form, and where this is not so, it nevertheless remains that linguistics is mainly concerned with what, from speech, *can* be written down with common writing techniques. Of course, many aspects of what we do with our voices when speaking - including intonation, for instance - are being incorporated into linguistic science, but this incorporation began only relatively recently and it is far from complete. As for kinesic aspects, including so-called "co-speech gesture", these are only grudgingly admitted, if at all. Co-speech gesture, in particular, though now it attracts considerable attention, does so not so much for its own sake but for what light it might throw on the *speaking* process. Thus we wonder: do these manual actions help us retrieve the words we need to speak with? (e.g. Krauss et al. 2000) or do they help us organize our thoughts better so that we can speak them? (Kita 2000, Goldin-Meadow 2003) or is it that they make manifest the imagistic aspects of thinking and so, by studying them, we gain a special 'window' on to what is going on in the mind of the speaker as he speaks? They can be useful, it is argued, as indicators of what is involved in what has been called *thinking for speaking* (Slobin 1987; McNeill 2005).

Questions of this sort, I suggest, would only have arisen against the background of a view of language and speech that sees it as strictly *verbal*, and sees it, in fact, as what can be abstracted from the flow action that counts as utterance largely, perhaps wholly, in terms of what we can write down. And this view of language, so I think, finally came to dominate after written language came to dominate the culture, as it did, finally, in Europe, at least, in the nineteenth century. If you go back to the eighteenth century, and earlier, the role of gesture in discourse seems much more accepted, indeed it was cultivated as a part of an Art of Speaking (see, for example, Austin 1806; see also Barnett 1987). But as European culture finally lost its oral character and became dominated by language in its written form, those who thought about how language operates, the process of communication, and so forth, thought only about how this worked through words. It took the revolution in recording technologies to remind us (rather to many people's surprise, in fact) that in communicating with one another people also employed their bodies in a variety of ways. It was as a consequence of this that the idea of "nonverbal communication" became current (Kendon 2004, ch. 5). As may be noted, this term pre-supposes that there is the communicating that we do with *words*, on the one hand, and then there is the other kind. The very term encouraged an approach in which it was to be accorded separate treatment. Only very lately, after our culture has been saturated for many decades with cinematic, video and television imagery, is the idea at last becoming widespread in learned circles that communication that involves language actually also involves more than the words spoken. Nowadays, one does not hear the term "nonverbal com-

munication" quite as often. Nowadays it is recognized that communication is "multimodal". Steps are beginning toward a more integrated view.

As I have already suggested, as a consequence of this history, the twenty years or more of growth in the study of co-speech gestures has mainly been about what they might reveal about internal psychological processes. As a result, we largely lack good detailed descriptions of how, in the production of utterances, these movements are used and how they may contribute to the utterances of which they are a part. We have few accounts of the forms of gestural expressions that speakers commonly use. We lack accounts of how the hands are used as descriptive devices or how they express the pragmatic aspects of a participant's engagement in talk (as they commonly do), what the circumstances are in which gestures are used and what the circumstances are when they are not used, whether and in what way there are changes in how gestures are used as the speaking register changes, the extent to which there are cultural and social class differences in the use of gestures - and so on. We remain with very little systematic understanding of most of this.

1. Different Uses of Manual Actions by Speakers

In this talk I will present three very short extracts from different occasions of rather commonplace interaction situations in which the speakers are using gestures, and with these examples I intend to illustrate some of the principal ways in which, as far as I can see, such manual actions enter into and operate as a part of the utterance construction process. I shall do this entirely from a production point of view. In the examples I shall present it will, I think, be obvious, that these movements are completely integrated into the *ensemble* of actions which constitute the utterances in question. They are part and parcel of the whole way in which the speaker goes about producing the complex of acts intended *for* another or others as an utterance, the complex ensemble of actions by which he *says* something to another or others.

Whether, and to what extent, other persons actually process these movements and the extent to which this contributes to other persons' perception or comprehension of what the speaker is doing is not a question I shall enter into here. There are good reasons to suppose that the kinesic components of utterances do have consequences for how an utterance is perceived or responded to, but I won't review this here (see, for example, Beattie and Shovelton 1999, 2001, 2002). My interest, rather, is to try to give some concrete illustrations of the way in which people engaged in utterance production deploy their speech and kinesic actions in relation to one another and how, in doing so, kinesis and speech are employed together in a kind of constructional process. As my three examples will show, there are several different ways in which this happens - these "semantically significant movements" or gestures can contribute in *different* ways to the utterance of which they are a part.

The three examples I shall present are very short and utterly commonplace. Nevertheless, as you will see, they are 'dense' in gesture use and show consider-

able richness. All three of them are drawn from recordings made in Italy - two in or near the city of Naples, one in an academic context at a University in Calabria. They have been selected to illustrate three of the main ways in which manual actions appear to be used by speakers.

First of all, manual actions recognized as gestures, may be employed in such a way as to provide dimensional and dynamic movement information about the properties of objects or actions the speaker is talking about. In this usage, these movements often have a kind of adjectival or adverbial function, giving an idea of the relative dimensions, shape or spatial positioning of nominated objects, or referring to the manner of some action mentioned by a verb. When used in this manner, such movements can contribute to the propositional content of what the speaker is saying. They play a role that could have been played by words, had the speaker cared to use them.

Another common use of manual actions while speaking is to use them as a way of suggesting the presence of concrete objects which are offered as representations of the entities (these may be abstract or concrete) a speaker is talking about. Such entities, once created through manual action, can then be moved about or placed in relation to one another and so serve as visual diagrams or movement patterns that display in visible form aspects of the relationships obtaining between these entities also being described in the associated spoken discourse. In this sort of usage, the hand movements may not add anything to the propositional content of what is being said, but they may represent this content in another way. In these cases the gestures work much as diagrams or drawings do that are used to exhibit visually things being explained in a written text.[1] Both of these kinds of uses may be called *representation* uses of manual actions.

It also is common for speakers to engage in manual movements that can be recognized as schematic forms of actions such as offering, grasping, withdrawing the hands, holding small objects in a precision grip, sweeping things aside or brushing things away, and the like, which are so placed in relation to the speaker's verbal discourse that they are understood as expressions of the forms of *pragmatic action* that a speaker undertakes in speaking. Here, it seems, by these manual actions the speaker acts out or performs, albeit in a highly schematized manner, the illocutionary actions performed in the talk. As speech act theory proposes, any act of speaking also counts as a mode of action, a mode of making a move of some sort in respect to those for whom the act of speaking is intended. Thus in saying something one may *assert*, *request*, *beg*, *deny*, *withdraw*, *hold up*, *stop*, *offer*, *present*, *indicate* and a host of other actions. One often finds that the manual actions associated with speaking are forms of action that express these kinds of

[1] Such gestures sometimes are called "metaphoric gestures". The gestures, of course, are not metaphoric although the treatment in the speaker's discourse of abstract ideas as concrete objects or processes which the gestures illustrate is. For discussion and examples of this sort of gesture use see, especially, Cienki and Müller (2008).

pragmatic meanings rather than expressing something about the propositional content of the discourse.

In fact, this is an extremely important aspect of gesture use which, quite surprisingly, has received very little attention in contemporary gesture studies. This sort of gesture use was well known to students of rhetoric, and in one of the more famous passages from Quintilian's treatise on Roman rhetoric from the First Century AD, gestures of this type are given detailed treatment (Butler 1922: XI, line 85ff). For detailed modern discussions, see Kendon 2004 (ch. 12 and 13) and Streeck (2009).

Two other important uses of gesture must be mentioned, although these will not be illustrated here. There is the use of gesture in *pointing* and the use of gesture in *interaction regulation.* So far as *pointing* is concerned, people use their hands to indicate the objects that are the topics of their discourse and, as is very well known, sometimes a piece of spoken discourse is incomprehensible without the kinesic deixis that is conjoined with it. Pointing is itself a complex phenomenon and can be done in many different ways, and the way it is done - for example, what sort of a hand shape is employed, or whether a pointer uses head or lips or hand or foot, and so on, - may have semantic consequences of various kinds (See Kendon 2004, ch. 11). With regard to *interaction regulation*, there are many ways in which manual actions are employed for this. For example, manual bodily action is involved in the offering and exchange of *salutations*, one sees people directing people to engage in actions with their hands - such as 'stop' 'approach' 'go back' 'turn round' and so forth. Or there are ways in which people employ their hands to claim or to request a turn at talk in conversation.

This division into four uses of gesture is not, I should emphasize, intended as a *typology* of gesture. It is a useful guide, however, at a very broad level, to the main ways in which gestures are used. It is important to see that any given instance of a gestural act may very well be participating in more than one of these uses at once - although it seems that gestural actions can be more or less *specialized* for these functions. Especially when gestures are used for pointing, interactional regulation and pragmatic purposes, we find there a tendency for forms to be conventionalized. Much gesturing used for representation may also follow conventional forms, but if you think about the vocabularies of so-called "emblems" that have been published, an analysis of what they are reputed to mean shows a preponderance of interaction regulation and pragmatic functions, rather than representation functions (see Kendon 1981, 1984; Payrató 1993).

2. Three Examples

I turn now to my three examples. In the first example we shall see how a speaker, in describing something, makes use of hand movements as part of the description, so here the hand movements enter directly into the utterance as a description and they add to the propositional content of what the speaker is saying. In the second example, we shall see a speaker who uses his hands to create a visual representation of the entities he is talking about and to show how these entities are related.

His use of hand movements here is not to add propositional information to what he is saying. Rather it is to present the contents of his talk in another mode. In the third example we will see illustrated how a speaker employs his hands to act out the pragmatic moves of his talk. In actions of this sort he makes manifest his pragmatic moves in kinesic form.

2.1. Example 1

The first example is taken from a video-recording made some years ago in a small town near Naples where a group of young people were talking about various things, including telling about the pets they owned. Here a girl has said that she has an aquarium. One of the adults present asks her to describe this, and the extract I discuss is the first part of her description.

In response to the request to describe the aquarium, the speaker begins a description of her aquarium with three tone units. She says:

(1) *Eii ci sono le pietre piccole/ci sono due pietre grandi/e ci sono l'erba là*
Eii there are the little stones/there are two big stones/and there is the grass

Each tone unit mentions a component of the aquarium – the gravel ("*le pietre piccole*"), the rocks ("*due pietre grandi*") and the vegetation, which she here calls "the grass" ("*l'erba*" although she means to say "*alghe*" – she corrects herself in a phrase immediately following which is not shown here). Associated with each one of these three phrases, distinctive manual actions can be seen. These we can analyze into what I call "gesture phrases" and in these terms there are two gesture phrases associated with the first unit, one with the second, and two with the third.

First, as she refers to the "*pietre piccole*" (the gravel in her aquarium), in her first gesture phrase she lifts both her hands up, held open palms down, moves them away from one another in a horizontal fashion, following this immediately by a second gesture phrase, accomplished by her right hand only, and done just as she says "*piccole*" in which the thumb and index finger are extended and held so that their tips are opposed. As I will mention again later, this gesture is often used as an expression that is the equivalent of the word "piccolo – small". Almost everybody sees the double hand movement of the first gesture phrase as a depiction of the spatial disposition of the "*pietre piccole*" – that is to say, with this horizontal double hand movement she is taken to suggest a horizontal distribution of the gravel she is referring to. I will come back to comment on the gesture performed with "piccole" in a moment.

Second, as she says "*poi ci sono due pietre grandi*" she lifts both her hands up together, moves them outwards into the space in front of her at a level somewhat higher than her previous gesture. The hands are held with the palms facing outwards, the thumb and forefinger of each hand are extended, opposed but flexed, the other digits flexed toward the palm. This action is typically seen by most people as an action that serves to place or position two objects in front of

her, and it is taken to be the two "*pietre grandi*" that this hand action refers to, the action as it were displaying the placement of these two large stones.

Third, as she says "*e sono l'erba là*" she brings her two hands in front of her, oriented with palms down, thumb and forefinger brought in close opposition to one another (though in a relaxed manner), and then rapidly lifts first right hand then left hand in alternating actions. Just as she says "là" at the end of the phrase, her two hands turn outward and are held palm out with thumb and forefinger extended. The alternating upward lifting hand action of preceding gesture is typically seen by observers as a sort of "pulling upwards" action and is taken to mean that something is shown standing vertically – not a rigid thing, however; and the alternating actions of the hands suggest that there are several of them. Combined with "*l'erba*" it is typically understood as an action that refers to the vertically upstanding vegetation inside the aquarium.

In short, it is as if, with these actions, the speaker is sketching in certain visual features of the objects she is referring to. If we accept this, we can see that in such sketching she provides certain additional information that is not to be derived form her words. We get the idea, from the combination of the horizontal movement of open palm-down hands with the first phrase, that the little rocks or gravel she is referring to are distributed horizontally; from the combination of hands held forward of the third gesture with the phrase referring to the "*due pietre grandi*" we are given the idea of two objects – here the "*pietre*" – placed side-by-side one another above the horizontal gravel; and from the combination of the right-left alternation of upward movements of the two hands held in a loose thumb-finger precision grip configuration, together with a reference to "*l'erba"*, we are given the idea of the upward standing filaments of "grass" or "algae".

I think seeing the gestures in this way and understanding the contribution they make to the overall meaning depends a good deal upon knowing that the speaker is talking about an aquarium and upon our general knowledge of what small aquariums are like. Nevertheless, I think it is clear that with these gestures, placed as they are in relation to her words, we learn not only *what* components of the aquarium there are but we learn something of how they are disposed in space in relation to one another and we are referred to what an aquarium might look like. Words and manual actions combined, thus, if the manual actions are understood in the way we have suggested, provide a *richer* description of the aquarium than just her words alone would do. This kind of use of manual action when speaking in discourses in which objects are being described is entirely typical. There is no need for me to multiply examples of this sort of thing here. (See Kendon 2004, chapters 8-10 for many similar examples. See also McNeill 1992 and Streeck 2009.)

Now, if we accept the interpretations I have given of these hand movements - that is, that they are semantically intended movements, the first one showing 'horizontalness', the second expressing the concept of 'little', the third showing two largish objects placed in space and the fourth showing a plurality of flimsy upstanding things - we can see that, when taken in conjunction with the words

uttered, they provide information about the spatial disposition, arrangement and visual appearance of the objects in the aquarium being described, well beyond anything that could be gathered from the words alone. They are a part of the speaker's description, that is to say. The features suggested by the hand movements could equally well have been suggested by some additional words. She could have said, for example, "*Eii ci sono le pietre piccole disposte orizzontalmente sul fondo dell' acquario, poi sopra ci sono due pietre grandi, una accanto all'altra, e ci sono l'erbe là, che crescono in modo verticale* - Eii there are the little stones arranged horizontally at the bottom of the aquarium, then there are two big stones above, side by side, and there is grass growing upwards vertically." But she didn't. She used hand movements of a certain sort to refer to some of these aspects, instead.

The speaker, in the turn space she is given, is to convey some idea of how her aquarium is organised, and she does so using words to nominate certain objects and hand movements to say something additional about how these objects are disposed in space and what they look like. How these hand movements serve to do this is by using visuo-kinesic schematic devices which serve to evoke or enable concepts like 'horizontalness', 'solid objects placed in space', 'flimsy strips rising upwards'. Thus, her two-handed horizontal gesture is a conventionalised schematic that stands in relation to the concept 'horizontal' in much the same way that the word itself does. The hand poses in the gesture done in relation to "*due pietre*" is a widely used device to suggest 'solid object' and the dynamic character of the gesture here is a widely used *practice* in kinesic expression to convey the idea of something firm in its position in space. In other words, these hand movements are *kinesic schematics*, constructed according to certain widely shared kinesic expression practices which refer us to general conceptual categories about shape, spatial position, and size (cf. Streeck 2008). As such, they can be employed in the task of utterance construction, playing a role very similar to that of verbal lexical items. Sometimes these kinesic schematic actions can be fully conventionalized and semantically equivalent to spoken words. We see this in the movements performed as she says "*piccole*" or "*là*". These are not only timed coincidentally with the pronunciation of these words, they are commonly glossed with these words. The gesture she does when she says "*piccole*" is a conventionalised form, widely used by Neapolitans in certain contexts when they refer to something that is "small" or "little" or "a little bit" (see de Jorio 2000:329-330). When she says "*là*", as already noted, she extends her index fingers forward, as if pointing, an action semantically equivalent to saying "there".

A further point may now be noted. The movements associated with the words "*piccole*" and "*là*", as we have just noted, seem to be kinesic equivalents of just those specific words. Here these movements really do seem to have a status just like that of individual lexical items. On the other hand, the horizontal hand movement done with "*ci sono le pietre* - there are the stones", the extended-arm-hand in 'grasp' pose done with "*ci sono due pietre grandi* - there are two big stones" and the alternating upward hand movements done at the same time as "*ci*

sono l'erba - there is the grass" extend over several words and, furthermore, they do not fit semantically with any words in the verbal component. Here their meaning seems to add to the meanings expressed in the words with which they are associated. Yet, as we have suggested, these movements are kinesic schematics and refer to conceptual categories, very much like spoken words do. We can see them, then, as entering into the utterance construction as if they might be lexical items (working as adjectives or adverbs), yet, because they are *kinesic* forms they can be done (as they are here) simultaneously with speaking and can, accordingly, add further semantic expression *simultaneously* with the words. These movements don't have to *alternate* with words, so they don't enter into the organisation of the talk sequentially, but this does not seem to be a good reason to exclude them as lexical elements in the utterance construction. Rather, we may say that the speaker's sentences are being constructed in more than one dimension at the same time. The speaker here shows us how it is possible to engage in what have been termed "simultaneous" linguistic constructions.

The notion of simultaneous linguistic constructions, which might require a representation of syntactic relations in three, rather than two dimensions, has recently been discussed by Bencie Woll in an essay dealing with a debate (Woll 2007), that began in the eighteenth century, concerning the apparent fact that for speakers the meaning of what they want to say is present "all at once" and that a problem they face, if they are to express this in spoken language, is to organize the material so that it can be presented in the linear manner that speech requires. It is the function of syntax to serve this linearization of expression. However, it has been suggested that this is a consequence of the kind of expressive vehicle that speech makes use of. It uses a set of articulators which serve to produce successions of sounds and it is this that forces speech to be constrained to the temporal linear dimension. In sign languages, on the other hand, the hands and the head, the face, the mouth, and also the whole body, can all serve as articulators and this means that there can be a differentiation of expression in space as well as in time. And, as students of sign languages are coming to see, *simultaneity* in syntactic construction is not only a possibility but is actually observed. It has been noted as a feature of signed languages since the work of Stokoe (1960), and has lately become the focus of a number of investigations (Vermeerbergen et al. 2007).

Woll describes the contrast that is often made between signed languages and spoken languages in this regard: "with just one set of articulators, spoken languages have linearity; with multiple articulators (two hands, face, mouth, etc.) signed languages have simultaneity" (Woll 2007:340). However, it should be pointed out that users of spoken languages *also* have multiple articulators. As we see in the case of the example we have just examined here, making use of the hands as our speaker did in this case, she was able to overcome the limitations of the spoken modality and was able to produce a construction every bit as 'simultaneous' as any we might find in signed language discourse.

I am suggesting, in other words, that at least in the case of this kind of gesture-use in relation to speech, we can entertain the possibility that a speaker may

employ units of expression that have semiotic functions quite similar to spoken lexical expressions which, nevertheless, being in the kinesic modality can be employed simultaneously and in parallel with words. The speaker thus has available a solution to the constraints that a strictly spoken verbal modality imposes.

2.2. Example 2

I turn now to Example 2, which shows a rather different way in which manual expressions can be employed by a speaker. This example is taken from a video recording of a seminar in which the speaker was discussing aspects of Down's syndrome. In this example we see several further features of the gesture/speech relation and we see another way in which a speaker can use manual expressions in relation to his verbal discourse.

In the extract considered here, the speaker mentions two concepts: cognition and language. He refers to the observations that some have made on Down's syndrome children that, because these children may show a good deal of linguistic sophistication, yet are apparently retarded in respect to other kinds of cognitive abilities, this is a natural demonstration that "cognition" and "language" are separate components or modules, that linguistic ability is independent of general cognitive abilities. He says:

(2) *questa è la dimostrazione naturale/che la cognizione e il linguaggio/*
sono aspetti dissociabili tra loro/no?/perché non c'è una correlazione
this is the natural demonstration/that cognition and language/
are aspects dissociated from one another/no?/ because there is no correlation

For the purposes of our immediate interest, we begin with his second phrase, when he nominates the two concepts that are to be the topic of his discourse: "*cognizione*" and "*linguaggio*". As he nominates the two concepts, first his left hand and then his right hand are positioned on either side of his body in space. The hands act as if two entities are being held for view, each one on either side. Here, by the way the speaker uses his hands, it is as if he is holding up two different objects. Because, as he brings his left hand into position as he says "*cognizione*" and as he brings his right hand into position he says "*linguaggio*", we are inclined to interpret this to mean that the two virtual entities being held up are labelled "*cognizione*" and "*linguaggio*", respectively. For this reason we are inclined to say that the speaker is treating "cognition" and "language" as if they are two separate concrete objects which can be held in the hand.

In his next phrase the speaker goes on to say something about the relationship between these two concepts and, as we seen, having set them up with his hand action as if he has two objects which represent them, he now moves his two hands in relation to one another in such a way as to provide a kind of dynamic diagram of the relationship between the concepts as he describes this in words. He begins phrase 4 by saying "*sono aspetti*" – here he is referring to both concepts at once,

and it is notable that he lowers both his hands in unison over "*sono*" and raises them and separates them in space, again in unison as he says "*aspetti*". Talking of both entities together, as he does in what he says, the movement in unison of his two hands seems to reflect this. The two objects are being treated together, as they are being referred to together. Then, as he says "*dissociabili tra loro*", he brings his two hands together in space and then rapidly separates them – as if showing how, if these two entities are placed in the same space, they will not remain there but move away from one another into separate spaces, in this way presenting in the form of dynamic spatial action, their non-association.

What this example illustrates, then, is that here the hands are used in actions that are like holding objects or moving objects about in space in the context of a discourse which describes abstract relationships between conceptual entities. This is a very common use of gesture and it may be compared to the illustration of abstract concepts with drawings on a blackboard or, as sometimes happens in classrooms, the use of coloured balls or other objects to stand for geometrical or other mathematical concepts.

2.3. Example 3

The third example I would now like to present is taken from a video-recording I made with some students of mine in Naples some years ago in which ordinary Neapolitans were asked to talk about being Neapolitan or to talk about what are, for them, the important characteristics of Neapolitan culture. Here one of the students, Massimo, asks someone to give a typical recipe. He says:

(3) *Allora/sulla cucina/ci può dare una ricetta/tipicamente napoletana/*
descrive cioè/dall'alla zeta/per quattro persone
well/about cooking/can you give a recipe/typically Neapolitan/
describe, that is/from A to Z/for four persons

We may divide Massimo's discourse into seven tone units or intonation phrases. In association with each one of these successive tone units we see a distinctive pattern of action in the hands. Already, at the level of the higher level units of production - that of speech phrases and phrases of gestural action - we can see a nice correspondence, a further illustration of the coordinate production of spoken and manual expressions. If we consider, now, the forms of manual action that Massimo produces here we see that what most of his expressions do is to provide a kind of enactment of the *pragmatic effect* of the corresponding unit of speech.

Thus, as he says "*sulla cucina*" (nominating the topic), he brings his hands together in a bunched fashion, in a form of action not unrelated to what people often do when they nominate a topic (Kendon 2004:230). Then, as he says "*puoi darmi una ricetta*" (here politely asking for something), he puts his hands together palm to palm in an expression that is very well known, often used (in Neapolitan culture) when people make polite requests, although also in certain other request-

ing contexts, too (Kendon 1995). He combines this with a bowing forward of the body, thus "doing" the bodily ritual of "polite request" even as his words make a request also. However, in his words he is able to nominate what he is requesting, which is a "*ricetta*".

He then says "*tipicamente napoletana*". By saying this, he limits the range of recipes he wants described. As he does so he uses a two handed expression that we might call "field delimiting" or "topic delimiting" - a form of action often used when people specify some field for consideration, as it were delimiting the 'space' within which the discourse is to be confined or focused (Kendon 2004:104). He then continues by saying "*descrive cioè*", thus making much more specific the task he wants his interlocutor to undertake. Here he uses a hand shape in which tip of index finger bends over to touch tip of thumb (sometimes called a "ring" hand shape) which is often used in contexts where the speaker is indicating that what he is saying is a highly specific focus within the wider field that he has established in his discourse (see Kendon 2004:342). He continues with "*dall'a alla zeta*". Here he moves his hand laterally in a horizontal fashion. Perhaps, with his hand moving through space in this fashion, he makes manifest in the form of a spatial movement the idea of passing across a range of locations. He makes visibly concrete the spatial metaphor that is implicit in the expression "*dall'a alla zeta*". Finally he says "*per quattro persone*", holding his hand up displaying four fingers as he does so. Here he presents a visible kinesic sign for the numeral "*quattro*".

Once again, in this example, we see how the manual actions are coordinated with the speech – the phrasal units of speech and the phrasal units of gesture are produced together and thus must be seen as integral components of the utterance action.

Second, as I have suggested in my brief analysis, the forms of manual action or gestures in this example are forms that are often used and, by comparing the contexts in which we see them used, we can identify rather general meanings for them. This leads me to say, for instance, that we have actions that are done in contexts of 'topic nomination', 'topic delimiting', that are done to mark a certain kind of request, and that are used in relation to a speaker's attempt to *specify* something. As I have said, these are forms that are, so to speak, kinesic versions of *doing* actions of this kind - doing the acts that the speaker is doing also with his speech and this is why we call them 'pragmatic'.

I should add here that what I have identified as 'recurrent forms' which permit a 'context of use analysis' have been identified mainly among speakers in Italy, mainly in the Neapolitan area. Some of these may well be characteristic of Neapolitans - the bowing forward with the hands held palm-to-palm is not used much in England, for example. Others have a much wider distribution - the 'topic delimiting' gesture, for example, appears to be quite widespread.

Third, if we accept these meanings we can see how, as we saw in the two previous examples, the 'semantic level' at which these actions relate to the semantics of the speech is variable. I have suggested how the first four appear to give visible

actions that relate to the *pragmatic actions* of what the speaker is saying. The last two, however, employ action to present aspects of the referential content of what he is saying. A horizontal movement in connection with a verbal expression which refers to the idea of a succession or a series of actions, and a presentation of the hand shaped in a certain way which is a conventional kinesic representation of the numeral "*quattro*".

3. The Lessons of the Three Examples

From these three examples, then, we can see, first, how delicately intimate is the coordinative relationship between these rather large manual movements that we perceive as "gestures" and the speech that is produced with them. Gestures and speech are produced *together* as products of a single, unitary, project of action. This is why I speak of the *gesture-speech-ensemble*.[2] Yet, if, in this case, we must admit these movements as partners with spoken elements in the utterances in question, we nevertheless must see that the roles they serve in these utterances is quite varied.

In the first example, we interpreted the movements as serving as contributions to the descriptions of the objects the speaker was talking about. We suggested that they entered into the construction of her utterance at the level of its propositional meaning and proposed that, in this case, we could incorporate the gestures into her utterance linguistically, if we accepted the idea that speakers, by using kinesic as well as verbal resources, could engage in 'simultaneous construction'. In the second example, on the other hand, we saw kinesic actions that worked in a much more 'parallel' manner. The upheld hands posed as if holding objects and the way these were subsequently moved in relation to one another were interpreted as presenting in kinesic form a *diagram* of the objects and their relationships that the speaker was talking about. In the final example we illustrated the so-called 'pragmatic' uses of gesture. Here, the kinesic expressions served to mark or express, as schematic forms of action, the illocutionary acts that the speaker was accomplishing with his utterance.

In the manual actions that speakers employ when speaking, thus, we see that they can do many different things and that the way speakers' manual actions relate, semantically, to the semantics of the speech can also be very different. A careful examination of even such commonplace examples as I have presented here, shows that the speaker is doing something with gestures that is intimately intertwined with what is being done with words and the gestures are employed with a diversity of purpose as the utterance unfolds.

[2] The recognition that gesture and speech are produced together as components of a single plan of action was developed in Kendon (1972, 1980) and elaborated extensively by McNeill (1992). The term "gesture-speech ensemble" is introduced in Kendon (2004).

4. Concluding Remarks

We have seen, then, that what these examples suggest is that engaging in the act of utterance - that is, in engaging in the production of a unit or units of action that operate as 'contributions' in situations where talk is the focused activity - 'speakers' (as we call them) draw upon a variety of devices or resources and construct their utterances as a complex orchestration of verbal spoken actions and kinesic or gestural actions. It seems clear that, from the point of view of the way in which 'languaging' is done (if I may be permitted such a verb), we must see it as indeed a *multimodal* ensemble of actions.

However, I think we still remain too much dominated by the idea that verbal language is an autonomous system which does not *need* these other forms of expression. It can get along quite well without them. And indeed, so it can. We especially have this idea because of the power of written language. But the question is, not *can* verbal language get along without other forms of expression, but *does* it and, if it does, when does it do so? That people routinely employ kinesic devices of various kinds as they actually construct utterances, suggests, I think, that from the producer's point of view verbal expression is often not enough and other devices must be employed. The model of verbal language that is used in theoretical thinking, however, is, to a large extent, a model based on an *abstraction* from the complex of actions involved in utterance production. As already mentioned, this is abstraction that writing has made possible and which, indeed, it nurtures. But this model, let us call this the autonomy model, does not give a satisfactory account of how people actually produce utterances much of the time. It has been the intent of my examples to suggest this.

Now I would like to add the comment that it is this autonomy model of language that has been the guiding model for the description not only of verbal language but for the description of signed languages, also. When, in 1960, Stokoe published his famous *Sign Language Structure* he set out to demonstrate that the model of language that was then current in American structural linguistics, which he had got largely from the work of Trager and Smith, could be applied to the visual communication system of the deaf that he had encountered at Gallaudet College (as it then was). Following this demonstration, which played an important role in the process by which such visual communication systems got recognition as being indeed *languages* (with all the prestige that comes when that label is seen to be deserved), it became a matter of high priority by many, in those early days of sign language research, to demonstrate in detail just how well the autonomy model of language could be employed to describe sign language - to such an extent that various aspects of sign language that did not fit well with this, such as 'iconicity' and the 'gesture-like' aspects of space use and the use of so-called 'classifiers', were either played down in importance or were incorporated into systematic linguistic descriptions in ways that often seemed highly cumbersome and forced (Wilcox 2004).

Gradually, however, students of sign languages have come to recognize that the autonomy model of language derived from the analysis of verbal language

does not fit, and a different model of language will have to be developed to deal with sign language. This is because, in the actual production of signed utterances expressive devices must be employed which don't fit the spoken language model. I refer here, for example, to Scott Liddell's (2003) work on the structuring of space in signed discourse and his argument that the way in which pronominal reference is accomplished is through processes which involve 'mapping' real and virtual spaces onto one another, rather than through the employment of an ever more complicated inventory of discrete 'morphemes'. There has also developed, in recent years, a debate about whether signers 'gesture' or not - but here again, it seems to me, that this discussion is based upon the idea that there is something that is called a 'language' - autonomous and separate - and this accounts for certain things, but what lies outside it must be 'gesture'. And yet it is becoming clear, both through Liddell's work, as I have already mentioned, but also through the work of others, that modes of expression used freely and commonly in sign language discourse which yet don't fit the autonomy model, are actually an integral part of the way signers construct utterances (see discussions in Emmorey 2003, and see Cuxac and Sallandre 2007, Fusellier-Souza 2006, Pietandrea and Russo 2007, among many others). To separate out these expressions that don't fit as "gesture" or to worry about whether they are "gesture" rather than "sign" seems to be a product of the persistence of the autonomy model and our failure to develop a unified model of utterance production that could incorporate them in an integrated way.

As I have suggested (Kendon 2008), I think it would be useful if we were to abandon altogether the use of both the term "gesture" and the term "sign" and try, instead, to develop a comparative semiotics of the utterance uses of kinesic action. If we do this we can, in the case of signed languages, see how, in signing, a wide range of semiotic devices are employed - all the way from Cuxac's "highly iconic structures" and the flexible way in which space is employed, to stable, codified or "frozen" forms which may be even be analyzable in terms of something analogous to a phonology in spoken language.

However, what we also see is that, if we look at people who use speech, and observe them as they construct utterances - as I have tried to illustrate with my examples today - we see how also they use a range of semiotic devices and, in the kinesic modality this range goes all the way from forms that appear to be highly codified, that work, as I have suggested, as devices that label conceptual categories (just like words do, or so-called "frozen" signs in sign language do) to forms that are quite like the "highly iconic structures" that Cuxac describes in his work on French Sign Language.

So if we compare instances of "languaging" - whether this is done entirely in the kinesic modality (as is the case in signing) or in a combination of the spoken and the kinesic - we see how in both there is a flexible use of a range of semiotic devices. If we want to compare signing with speaking we must compare signing with speaking as it is *performed*. Sign language does not have the benefit of millennia of a writing system and it can exist, thus, *only* in a performed manner.

Speakers can, and do, often organize their spoken utterances in relation to the forms and patterns developed as a consequence of language in its written form, but they do not always do so. And when we look at speakers as they are actively producing utterances we see that they, also, make use of a wide range of strategies.

Scott Liddell (2003) concludes from his analysis of American Sign Language in which he sees what he calls the "gestural" as being an integral part of its grammar, that this might lead us to develop a new way of thinking about language in general. What I hope I have suggested here is that, through the little examples I have provided, this new way of thinking could be highly useful, for it might provide us the basis for the *integrating* model that we need, if we are to have a good theory of *utterance* production and not just a theory of the construction of discourse in only one modality.

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Argument is Gesture War: Function, Form and Prosody of Discourse Structuring Gestures in Political Argument

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0. Introduction

Cognition is the basis of speech and gesture as co-produced and co-perceived channels of communication. McNeill (1992) shows the close conceptual linkage between gesture and speech. Sweetser (1998) notes that gestures which are not co-semantic with narrative content may function to create discourse meaning, such as managing speaker turns and manipulating speech contents as metaphorical objects. Bavelas et al. (1992) distinguish topic gestures, which refer to narrative content, from interactive gestures, which refer to the interlocutor, for the case of *conversational* dialogue.

The linkage between discourse-type cognition and non-narrative gestures, or, as I will call them, discourse structuring gestures (DSG, henceforth), has not yet been studied. In this paper, I look at DSG form, prosody, and function in political argument, and show that DSG in *argument* systemically differ from those that have been observed in *conversation*.

I believe that respective differences stem from the evocation of discourse type specific embodied concepts shared by interlocutors, such as primary metaphors and related frame inferential structure. While DSG in both *conversation* (Bavelas et al. 1992, Sweetser 1998) and *argument* (my data) show mappings based on the Conduit Metaphor, DSG in *argument* additionally display specific forms and performance modes based on the primary metaphor Argument is Physical Struggle. As for gestural function, it has been observed that non-narrative gestures in *conversation* may serve to "help maintain the conversation as a social system" (Bavelas et al. 1992:469), in contrast to conversation as alternating monologues. I show that the function of DSG in *argument* extends to *discourse control* over speaker role and content.

1. Defining Discourse Structuring Gestures

Whether we talk on the phone or to ourselves, or just go over something in our minds without speaking, we often gesture as part of our cognitive effort. My interest lies with DSG and thus gestures that occur in face-to-face communication.

Kendon (2004) defines gesture as any visible bodily action that creates meaning in discourse. Bavelas et al. (1992) distinguish topic and interactive gestures as the two subcategories of hand gestures.

1.1. Gesture and Speech Co-Timing

Topic or narrative gestures can be co-timed with speech and depict or add to narrative content. I observe that co-speech DSG frequently relate to utterances addressing the interlocutor (cf. speaker defense gestures co-timed with *"Let me finish"*: case (6)). This accords with Bavelas et al.'s (1992) observation that paralinguistic interactive gestures have topic independent paraphrases addressing the interlocutor. Another type of co-speech DSG that I observe in my data are completely unrelated to utterance semantics. However, their co-timing with specific speech parts seems crucial for their functions: profiling or enforcing such utterance parts that are regarded crucial arguments by the speaker (cf. content offence gestures: cases (1) and (2)) and negating ideas formerly introduced by the interlocutor (cf. content defense gestures: cases (3), (4), and (5)).

1.2. Synchronized and Complex DSG

Gesture analyses often focus on hand gestures and Bavelas et al.'s (1992) distinction of topic and interactive gestures (Bavelas et al. 1992:469). But people gesture with many body parts: hands, head, upper body and eyebrows, to only name a few. While we may gesture with each independently, I find that many DSG are *multilayered*: Their meaning is a product of co-performed movement of multiple body parts. In my data, I observe two types of such gestures.

First, movement of different layers may be parallel in form and function, stemming from the same embodied concept, e.g., a speaker defense gesture (based on Speaking is Forward Movement) performed with hand and head (cf. (6:G3)) or, a content offence gesture (based on Communication is Object Transfer) performed with head and hand (cf. (2:G2)). The implementation of multiple gesture tiers seems to function to increase a gesture's pragmatic force. They frequently co-occur with strong content offence or refusal (cf. (1), (2), and (5)) or in the context of a reoccurring struggle over speaker role (cf. (6)). I will call those *synchronized* DSG.

Second, body parts may co-gesture but differ in form, contributing different semantics and pragmatic functions, e.g., a hand speaker defense gesture and synchronic eyebrow crunch, where the first relates to the conceptual metaphor Speaking is Forward Movement and signals: 'stop speaking' (metaphorically: stop moving), while the second is non-metaphorical and signals something along the lines of: 'I am upset by your speaking' (cf. (6:G2)).[1] One may be tempted to

[1] Notice the different illocutionary forces of the two co-produced gestures: While the push gesture functions much like a direct directive ('stop speaking') the eyebrow crunch functions like an indirect directive ('I disapprove of your speaking'). For further discussion see Wehling: Bimodal Speech Acts, in work.

interpret the hand movement as carrying the main semantic weight and the eyebrow movement to be some kind of gestural intensifier. This is not the case: In the same discourse event from which the above example is drawn an eyebrow crunch is used by the gesturer to signal 'I am upset by your speaking', upon which the interviewer stops speaking as she rightly interprets the gesture as an indirect directive. I will call multilayered gestures whose layers' movements differ in form and do not relate to one single underlying cognitive concept *complex* DSG. They are different from synchronized DSG in that they may combine different illocutionary forces due to form differences on the multiple layers.

1.3. Gesture Prosody

Whether and how to parse gestural movements into those that contribute to form and those that are prosodic is to my knowledge a question that has not yet been raised in bimodality studies. One might ask why we should bother to think about form and prosody as two levels of gesture, given the vast differences between the systems 'language' and 'gesture.' The reason lies with my interest in argument specific DSG. Speech forms in argumentative discourse do not differ from words used in other dialogues. Languages have no argument specific lexicon. Aside from form frequency, the most salient characteristics of argumentative speech are prosodic: intonation, pitch, speech rhythm and so forth. I believe that the same holds for gesture, e.g., fend off and push gestures can be used in *conversation* and *argument* to signal: 'Let me finish'[2] or 'I refuse what you just said'.[3] While such forms are more frequent in arguments, highly salient elements of argumentative DSG are bound to be prosodic. I expect gesture prosody (or performance mode) to relate to those conceptual mappings that shape our overall discourse type cognition.

One needs to decide, then, what elements of gestural movement to consider prosodic. An eyebrow crunch co-timed with the repetition of a hand push may at first glance seem to function alike speech prosody, such as a higher pitch when repeating: *"Let me finish"* (cf. (6:G2)). However, the eyebrow crunch can independently establish meaning (see above). I propose to treat co-gestures that can function as autonomous form-meaning pairs as part of multilayered gestures' form. Gesture prosody, then, establishes itself on the level of performance mode: bodily intensity (speed, abruptness, force of stroke; tenseness, laxness of gesturing body part) and spatial performance (gesture radius). Increased speed and abruptness during the repetition of a hand or upper body push in fact seems to be a functional equivalent to a higher pitch and change in speech rhythm during the repetition of *"Let me finish"* (cf. (6:G3)).

I ought to be careful not to oversimplify the relationship between speech and gesture prosody and the complex matter of how both relate to cognition. The notions presented here are tentative. I suspect one finds interesting relationships

[2] Conceptual Metaphor: Speaking Is Forward Movement.
[3] Conceptual Metaphor: Conduit Metaphor.

between the three when closely examined, e.g., gestural radius could conceptually relate to pitch: Louder speech carries, metaphorically, *further*. A gesture that reaches far towards an interlocutor seems to serve the same pragmatic function.

2. Dialogue Subtypes: Metaphorical and Frame Inferential Mappings

Interlocutors access speech and gesture meaning via shared embodied knowledge, such as primary metaphor. Production and perception of speech and gesture frequently draw from the same cognitive structures (McNeill 1992, Sweetser 1998). Gestural mappings have been accounted for in gesture with regard to form: "In gesture (…), there are systematic metaphorical mappings (…) remarkably parallel to the mappings seen in linguistic usage" (Sweetser 1998:2).

My hypothesis for DSG is that how we gesture (form and prosody) and why we gesture in a certain way (function) relates to conceptual metaphors and frame inferences that structure our discourse type cognition. Commonalities and differences between DSG in *conversation* and *argument* are grounded in respective conceptual commonalities and differences.

Grady (1997) defines primary metaphors as based on reoccurring subjective and sensorimotor experiential correlations. An experiential scenario that gives rise to mappings onto the target domain 'dialogue' is that of object exchange. As a child, you give an object to someone so that he or she can see[4] and manipulate[5] it. Reddy (1979) subsumes the resulting mappings under the Conduit Metaphor: Ideas Are Objects, Words Are Containers and Communication Is Object Transfer. Examples of linguistic usage are *giving* and *getting* ideas (Johnson and Lakoff 1980). Gestural mappings have been accounted for in *conversational* dialogue where interlocutors use their hands as iconic containers when offering ideas or hold hands up as if to stop oncoming objects when refusing ideas (McNeill 1985, Sweetser 1998). The conceptualization of *argument* has its roots in the primary metaphor Argument is Physical Struggle: Before language acquisition, interpersonal conflict comes in the form of physical struggle (Lakoff and Wehling: 2006). Later, physical struggle is accompanied by words. Our understanding of *what* we do when we argue with one another and how we establish *control* in argumentative discourse thus directly relates to notions of physical control. Johnson and Lakoff (1980) observe how respective mappings structure linguistic forms. In my data, I find gestural forms and performance modes that relate systemically to the source domain 'physical struggle', namely because of their discourse function: control over *who* speaks and *what* is being said, conceptualized in terms of physical control.

3. Data Analysis

I distinguish two functional classes: offence and defense gestures, regarding speaker or content. Both classes are structured by Argument is Physical Struggle

[4] Conceptual Metaphor: Knowing Is Seeing.
[5] Conceptual Metaphor: Thinking Is Object Manipulation.

and the entailed concept Argument Control is Physical Control. Notice that this does not predict that one finds metaphorical form mappings in each gesture. Gestures' form and prosody may "just" stem from the discourse conceptualization's inferential structure and be iconic for the kind of movement one would implement when involved in an actual physical struggle.

3.1. Content and Speaker Control Gestures

Content control gestures are the product of a blending of Argument is Physical Struggle and Conduit Metaphor (including the frame inferential performance parameters Mode of Content Communication is Mode of Object Transfer).

Non-narrative gestures based on the Conduit Metaphor are commonly used in *conversation* to 'offer' or 'refuse' ideas (Bavelas et al. 1992, Sweetser 1998). Their prototypical form is an outstretched hand with an upward facing palm (offering ideas) and a raised hand with the palm facing the interlocutor (refusing ideas). I observe those gestures in *argument*. This does not surprise since both *conversation* and *argument* are subtypes of 'dialogue' and respective metaphorical mappings are inherited. However, the domain 'argument' has additional frame structure that is *not* part of general dialogue conceptualization. What interest me are cases where *argumentative* content gestures differ in form and prosody from those in *conversation*, based on their pragmatic function.

As a result of the blending of the struggle-frame and Conduit Metaphor, ideas are conceptualized as harmful objects, as means to gain discourse control. First, metaphorical objects are not simply offered. They are pushed towards the interlocutor with the intention to 'harm', or 'hit with increased force' (cf. (1:G) and (2:G1/G2)). I call those *Content Offence Gestures* (COG, henceforth). Second, ideas presented by the interlocutor - conceptualized as approaching harmful objects - are in the majority of cases not just fended off, but rather pushed back. In the most graphic case by using the whole body to push an idea all the way back into the interlocutor's personal space (cf. (5)). I call those *Content Defense Gestures* (CDG, henceforth).

Speaker control gestures are structured by Speaking is Forward Movement and Argumentative Engagement is Physical Engagement (including frame inferential mappings onto the performance mode Mode of Speaking is Mode of Movement).

Non-narrative gestures based on Speaking is Forward Movement, such as a raised hand to signal 'stop speaking', have been observed in discourse (Kendon 1995). Such gestures used in an argument seem to differ in form and prosody from those in *conversation*, based on their discourse function: In argument, the kind of movement that leads to physical control is mapped onto the mode of gesturing that leads to discourse control. First, speakers are in the majority of cases not just fended off (as is the case in less argumentative dialogue) but pushed back (cf. (6:G2,G3)). Second, the physical intensity of the gestures and their radius seem to increase in correlation with an intensified struggle over speaker role (cf. (6)). I call those *Speaker Defense Gestures* (SDG, henceforth).

Boundaries between conversational and argumentative speaker defense gestures are gradient. Form and prosody differences may (i) be a result of a shift towards a more argumentative discourse or (ii) work towards bringing about that shift. The second kind of gestures that stand in conceptual relation to Speaking is Forward Movement and Argumentative Engagement is Physical Engagement are those that accompany verbal attack: An argumentative attack on the speech tier occurs co-timed with an iconic gestural attack (cf. (7)). They are different from COG in that they are co-produced with a whole utterance, not single ideas as concrete entities. They are also different in form in that they are not iconic object pushes but rather sharp points, or 'stabs'. I call those *Speaker Offence Gestures* (SOG, henceforth).

3.1.1. Content Offence Gestures

Below, I report three instances of COG: multilayered co-speech pushes (form) executed in a sudden and forceful manner with tense gesturing body parts (prosody). All three are *synchronized* DSG as defined above. Two are performed with upper body and head (1:G and 2:G1), one with head and hand (2:G2).

Case (1)

starting position G: <u>who (...) demoted</u> end position
Utterance tier: *And the best guy in the country, Dick Clarke, <u>who got demoted</u>.*
Gesture tier: upper body / head push

Case (2)

starting position G1: <u>against (...) people</u> G2: <u>against (...)-hood</u>
Utterance tier: *Saddam Hussein had weapons, used weapons of mass destruction, <u>against his own people</u>* (G1) *<u>against the neighbourhood</u>* (G2).
Gesture tier: (G1) upper body / head push, lean back to semi-neutral position
(G2) right hand / head push, palm facing interlocutor, lean back to neutral position

Why should one classify these gestures as COG? The strokes are co-timed, but not co-semantic, with a specific utterance part, namely one that is regarded a strong argument by the speaker. How do we know, aside from the gestural cue? The co-timed speech has prosodic features distinguishing it from the preceding utterance. It is produced with a rising intonation and higher pitch (2:G1) and higher pitch with slower, punctuated speech rhythm (1:G). In terms of frame inferential reasoning, the gestures seem to be conceptualized as functioning to push forth crucial ideas (metaphorically: harmful objects) with the intention to weaken the interlocutor's argumentative position (metaphorically: harm by hitting with increased force).

(1:G), (2:G1) and (2:G2) show the same gestural mappings but implement different body parts ((1:G): upper body, head; (2:G1): upper body, head; (2:G2): hand, head). In (2:G2), notice the orientation of the gesturer's hand with regard to spatial conceptualization: The palm is directed towards the interlocutor at a height and with an orientation so that, if we were to trace the line of a released forward moving object, the path endpoint would be the interlocutor's body, not some point within the shared gesture space. This is expected given argument-frame inferential mappings; the object ought to hit the interlocutor, not the ground.

How can we distinguish the above COG from CDG, SDG and SOG? The gesturer does not negate an idea prior introduced by the interlocutor, so this is not a CDG. The gesturer's speaker role is unchallenged, so this is not a SDG. The pushes are executed in a quick manner at the boundary of the gesturer's personal space. Retreat to (semi-)neutral position is part of the stroke. This makes sense in terms of the motor movement we implement when pushing forth objects. The co-timed speech parts (cf. *who got demoted*; *against his own people*; *against the neighbourhood*) seem to be conceptualized as concrete entities, they are part of but distinguishable from the overall utterance.

How do the gestures relate to embodied knowledge? If we push something we do it (i) from a distance without making body contact (the pushes are performed at the gesturer's space boundary; there is no metonymic physical engagement via gesture space intrusion as is the case for SOG) and (ii) via a quick and forceful forth-back movement that follows the prototypical motor routine for pushing.

3.1.2. Content Defense Gestures

I will report three cases of CDG. The first is mono-layered and performed with the hand (3). The second is *complex* where the hand gesture shows a mapping based on Ideas Are Objects and the head and facial gestures signal something along the lines of 'careful now' (4). The third is *synchronized* where upper body, hand and head gesture show mappings based on the Conduit Metaphor (5). CDG are co-timed with the gesturer's negation of an idea prior explicitly or implicitly introduced by the interlocutor.

Case (3)

starting position G: I (…) Reagan!

Utterance tier: Obama: *Now, lets talk about Ronald Reagan. What you repeated here today is* Clinton: *No, nah, I did not…* Obama: *Wait, no, Hillary, you just spoke, you just spoke for two minutes!* Clinton: *I did not say anything about Ronal Reagan!*

Gesture tier: left hand raise, palm towards interlocutor

Case (4)

starting position G: He (…) now.

Utterance tier: Clinton: *Do you think Richard Clarke has a vigorous attitude about Bin Laden?* Wallace: *Yes, I do. I think he has a variety of opinions and loyalties, but yes.* Clinton: *He has a variety of opinions and loyalties now.*

Gesture tier: right hand raise, head / hand forward downward push

In case (3), Barack Obama introduces the notion that Hillary Clinton brought up the topic of Ronald Reagan: *"Now, lets talk about Ronald Reagan (…)"*. Clinton's negation *"I did not say anything about Ronal Reagan"* is co-timed with the hand fend off gesture. In case (4), Chris Wallace states that Dick Clarke has *"a variety of opinions and loyalties"*. On the speech tier, Bill Clinton negates: *"He has a variety of opinions and loyalties now"*. The gesture, a head and hand forward downward push towards Wallace, ends in co-timing with *now* after which Clinton retreats from Wallace's gesture space boundary.

3.1.3. The Prosody of Content Defense Gestures

While argumentative COG and conversational content offering gestures differ in prototypical form (push versus outstretched hand with upwards facing palm), argumentative CDG and conversational content refusal gestures are very similar in prototypical form, e.g., a raised hand facing the interlocutor, often followed by a, however slight, push. The (gradient) difference between such gestures in conversation and argument lies with prosody, especially bodily intensity and radius, e.g., in (4), Clinton's gesture is performed with a very tense hand, overall tense body posture and closeness to the interviewer's gesture space that is remarkable. He leans in *specifically* for the gesture. Case (5) further illustrates the linkage between discourse conceptualization and content refusal gesture prosody.

Case (5)

starting position G: No, (…) up!

Utterance tier: Wallace: *With respect, if I may. Instead of going through '93 and*
Clinton: *No, no, you asked it, you brought it up, you brought it up!*

Gesture tier: Upper body forward shift, hands raised, palms facing interlocutor, hands brought downwards in interlocutor's gesture space, left hand touches knee, synchronic head push

In (5), Wallace aims to change topic: *"Instead of going through '93…"* implying that Clinton brought up that topic. Clinton refuses the notion: *"No, no, you asked it, you brought it up"*. The co-timed gesture shows the strongest case of content defense we have seen so far. Clinton shifts his upper body towards the interlocutor. His hand push goes into Wallace's personal space and culminates in body contact. In terms of gestural mapping, Clinton not only fends off an oncoming object or pushes it back from a distance, he brings it all the way back to the interlocutor - as far away from his own body as possible.

Thus, content refusal force seems to correlate with both CDG form (cf. fend off: (3) versus push: (4)/(5)) and CDG prosody (general tenseness of all the strokes, and: gesture radius, compare (4)/(5)). Notice that in (3), Clinton steps into the shared gesture space to perform the gesture. In (4)/(5), Clinton leans towards Wallace (to different degrees) when performing the stroke. In terms of embodied knowledge, in an argument conceptualized as physical struggle, content refusal is stronger than in conversational dialogue since ideas put forth by interlocutors are metaphorically 'harmful' objects, a mean to gain discourse control by weakening

the interlocutor's position. Thus, potentially very crucial ideas (metaphorically: very harmful objects) are refused (metaphorically: fended off or pushed back) much more strongly and often *as far away as possible* from one's body.

3.1.4. Speaker Defense Gestures

I report three instances of SDG. (6:G1) is mono-layered. (6:G2) is a *complex* gesture, namely a hand push (based on Speaking is Forward Movement), the eyebrow crunch signals: *'I am upset/angry'*. (6:G3) is a *synchronized* gesture, a hand, head and upper body push (based on Speaking is Forward Movement).

Case (6)

G1: <u>May (…) finish</u>? G2: <u>Let (…) please</u>. G3: <u>Let (…) please</u>.

Utterance tier: Bush: *(...) Saddam Hussein…* Interviewer: *Indeed Mister President, but you didn't find…* Bush: *Let me, let me…<u>May I finish?</u>* (G1) (…) Bush: *It was a relative calm…* Interviewer: *But in your response to Iraq…* Bush: *Let me, <u>let me finish, please</u>.* (G2) (…) Bush: *(...) nobody cares more about the death than I do.* Interviewer: *Is there a point at which…* Bush: *Let me, <u>let me finish.</u>*

Gesture tier: (G1) right hand raised, palm facing interlocutor
(G2) right hand raise, forward downward push, eyebrow crunch
(G3) right hand raise, forward downward push, increase in force and speed, abrupt and fragmented mode, upper body inwards downward lean

In all instances Bush is being interrupted by the interviewer. The gestures are co-timed with either direct directives (G2,G3: *"Let me finish"*) or an indirect directive (G1: *"May I finish").* The gestures enforce the speech act. Notice that while the utterance is non-metaphorical, the gesture is based on Speaking is Forward Movement.[6] These are SDG, not CDG: First, discourse context and speech act clearly indicate a struggle over speaker role, and second, there is no content negation. G1 through G3 occur in sequential order. Interestingly, gesture form and prosody change in correlation with utterance politeness parameters (indirect to

[6] Although not reported in this paper, speech and gesture form may share gestural mapping, e.g.: The above gesture co-performed with "Stop right there", where "there" indicates a mapping based on the conceptualization of speaking as spatial movement.

direct directive) and prosody (increase in pitch, more segmented speech rhythm). Thus, Bush's directive gains intensity by changing speech form and prosody as well as by implementing increasingly 'strong' SDG: G1 is a mere mono-layered fend off performed with little tenseness and small radius. G2 is a complex SDG, where the push is performed with a tense hand and increased radius; the eyebrow crunch signals strong disapproval. G3 is a complex SDG where hand, upper body and head perform pushes. Notice that we can easily imagine G1 in a conversational setting, while G2 and G3 go hand in hand with a shift to a more argumentative dialogue. In terms of embodied knowledge, in an argument conceptualized as physical struggle, do we merely fend off an oncoming attacker or do we actually decide to push him or her back and if so, then how forcefully and how far from our own body?

3.1.5. Speaker Offence Gestures

I introduce one instance of SOG: A mono-layered right hand sharp pointing gesture, or 'stab':

Case (7)

starting position G: I wanna know (…) do anything
Utterance tier: *I wanna know how many people* (G1) *in the Bush-Administration* (stab1) *you ask why* (stab2) *didn't you* (stab3) *do anything* (stab4)
Gesture tier: hand reach towards and into interlocutor's personal space, four stabs on sheet with right hand index

In (7), the gesture refers to the question sheet between Wallace's knees, standing metonymically for questions being asked when interviewing members of the Bush administration: *"I wanna know how many people (...) you ask (...)"*. But this is more than just a referential pointing gesture. Clinton 'stabs' onto the question sheet, several times. There is movement into the interlocutor's personal space and physical contact within that space co-timed with a whole utterance.

Referential pointing is common in conversational dialogue, e.g. to cite the interlocutor (cf. Bavelas et al.: 1992). In argumentative SOG, the interlocutor's personal space is intruded (prosody) and the gestures are classifiable as 'stabs' rather than pointing (form). In terms of embodied knowledge, the argumentative attack is accompanied and enforced by an iconic gestural attack. The inter-

viewer's gestural response sheds further light onto the inferential structures evoked as part of the shared discourse conceptualization: Defense from speech (and gesture) attack is physical defense, here in the form of a disengaged body posture and hand inwards shield gesture.

4. Conclusion

I have taken a closer look at the discourse function, form and prosody of non-narrative gestures in relation to discourse cognition and the conceptualization of argument as physical struggle. I introduced a tentative distinction between gesture form and prosody for the analysis of DSG and argued that their specificities are a product of their discourse function, namely control over content and speaker role.

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