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Nonmanuals at the Gesture Sign Interface (NaGSI)

Abstracts

Nonmanuals at the Gesture Sign Interface (NaGSI), Göttingen University, October 9-10, 2015
Nina-Kristin Pendzich / Annika Herrmann / Markus Steinbach

Compositionality and The Grammar of the Body

Wendy Sandler (Haifa)

Pioneering investigations into non-manual signals in sign language (Liddell; Baker and Padden) appeared in a 1978 volume edited by Patricia Siple, aptly entitled, *Understanding Language Through Sign Language Research.* Since that time, research on non-manual signals has burgeoned and developed in many directions -- analyzing these signals as markers of syntactic structures, information and discourse structure, negation, intonation, and more (Pfau & Quer 2009, Hermann & Steinbach 2013). Very often, researchers (myself included) have relied heavily on models of spoken language analysis in these investigations. In keeping with the contemporary approach to language as a universal computational system in the mind, we have often explicitly or implicitly tried to understand sign language through spoken language research, in which structures in the mind are paramount and their physical 'externalization' secondary (Chomsky 2007).

Here I turn this approach on its head, to highlight benefits of a strategy that works not from mind to body, but from body to mind, in a paradigm I call 'The Grammar of the Body' (Sandler, 2013, to appear). The paradigm capitalizes on the visible, corporeal expression in sign languages of linguistic properties and relations that are often covert and even unnoticed in spoken languages (cf. Wilbur 2008; Malaia et al 2013; Strickland et al 2015). In particular, the approach I propose aims to show how the core linguistic property of compositionality is rooted in communicative use of the body (Sandler in preparation).

Beginning at the lexical (manual) level, I show how syntactic and semantic components of words are visibly manifested in the relation between the two hands (Lepic et al to appear). At the level of intonation, I review how the individually articulated and perceived face and head components of the system are combined and recombined independently of the lexical channel in different sign languages (Šarac et al 2007, Dachkovsky et al 2012). Finally, I show how the body-to-grammar approach provides a map of the order of emergence of linguistic components in a young language, Al-Sayyid Bedouin Sign Language (Sandler 2012, 2013, to appear). I conclude with current, somewhat radical work, that seeks the origins of the compositional structure of language in the face and body displays of extreme emotions (Cavicchio & Sandler 2015).

These different lines of research return to the spirit of Siple's book title, to show how sign language research can lead to insights about language generally. They suggest a paradigm for thinking about language and its core organizational principle – compositionality -- that has the communicative affordances of the human body at its core.

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Wearing your heart on your face: Nonmanual affective constructions in American Sign Language

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Emotions are central to the human experience, and we express them both nonlinguistically, through facial expressions and gestures, as well as through conventionalized linguistic expressions. In signed languages, natural expressions of emotion and linguistic encoding are not easily differentiated because both are produced by the same articulators.

This project investigated constructions signed by native users of American Sign Language (ASL) to describe affective events, that is events in which an experiencer undergoes an internal change upon perceiving a stimulus. For example if a boy at a zoo is fascinated by a bear, the bear is the stimulus of the affective event; the boy is the experiencer, and the affect type is fascination. This project began analysis from a semantic view, casting a wide net that included construction types that would traditionally be considered gestural or paralinguistic, but which are grammaticalized in ASL. Not only did obligatory nonmanuals align with affective lexical predicates and affective constructed dialogue, but consultants also produced constructions which referenced the affect solely through nonmanuals.

The data for this project were elicited from nine Deaf native ASL users. Each consultant watched a short film with no language in which characters experienced affective responses to both animate and inanimate stimuli. Consultants first retold the plot to a Deaf interviewer, then described six of the film's affective events shown individually as short video clips.

All of the 184 expressions that consultants used to describe affective events included nonmanual affective prosody. Furthermore, over half of the expressions did not lexically identify the affect, but rather indexed it through constructed action or constructed dialogue. In these expressions, it was the nonmanuals that specified the denoted affect. For example, the sign glossed UGH in (2) refers schematically to an experiencer's affect, but it is the nonmanual marking that specifies the type of affect. In this case, the experiencer's annoyance is indicated by slightly raised eyebrows, lowered lids, pursed lips, and tilted head (Ekman and Friesen's (2002) FACS: AU2+14+16+43+M56).

2)

affective prosodic marking

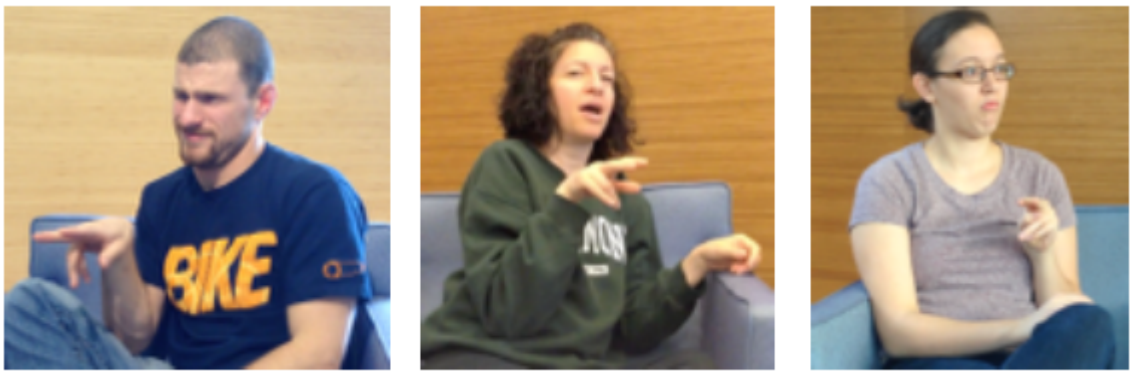
MAN STAND-UP LOOK-AT REALLY UGH

The man got up and was like „Oh my gosh."

In other constructions, the nonmanuals not only specified the affect, but fully composed the affective utterance with no affective manual component. In these constructions, the signer's hands either depicted the character's actions or produced the sign often glossed LOOK-AT. This sign was used to denote the experiencer's mental attention to the stimulus, and it was most frequently (37 out of 50 times) followed by an affective lexical predicate or constructed dialogue. In the remaining 13 out of the 50 constructions, however, the LOOK-AT sign was

held in place while the internal change was referenced solely through nonmanual articulation. The images in (3) illustrate just a sampling of the great variety of affect types that nonmanuals referenced.

3)



Because emotional facial expressions and body movements are pervasive for nonlinguistic uses, they may rightly be considered gestural. However, in these data nonmanual articulations appeared in environments that in other constructions were filled by lexical items, serving the same function. Additionally, the nonmanuals did not express the signers' own emotions, but rather the emotions of the experiencer denoted in the narrative. Facial expressions used in ASL affective constructions, therefore, can be considered a quintessential example of the interface between nonmanual gestures and signs.

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Pragmatic gestures at the gesture-sign interface: Nonmanuals and palm-up gestures among older Belgian French speakers and French Belgian Sign Language signers

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It is now assumed that both speakers and signers use gestures in language interaction, as these units are an integral part of linguistic communication (Sweetser 2009). In order to compare spoken and signed communication, Vermeerbergen & Demey (2007) recommend confronting sign languages with speech in combination with gestures. It is also admitted that, in contrast with spoken languages (SpLs), sign languages (SLs) offer the unique property to grammaticalize both manual and nonmanual gestures (Herrmann & Steinbach 2013). This paper aims to foster the knowledge on these issues by studying the palm-up gesture in combination with nonmanuals (including, among others, facial displays, gaze, head moves, and shoulders' moves), comparing their use in SpLs and SLs. The comparison will provide new insight into the hypothesized differences between grammaticalized (or, even pragmaticalized – Degand & Evers-Vermeul 2015) gestures and nonmanuals used in SLs, on the one hand, and co-speech gestures and expressive or interactive nonmanuals used in both SpLs and SLs, on the other hand.

In SpLs, the palm-up family of gestures (called 'Open Hand Supine' in Kendon 2004 and 'Palm Up Open Hand' in Müller 2004) comprises gestures with the following kinetic features: an open lax handshape with extended (not spread) fingers, a supine forearm, and an upward facing of the hand. Their shared semantic theme is assumed to be linked, at some point, to a 'giving/offering', or 'readiness to receive' core meaning (Müller 2004). The three-fold classification of their uses in context (Kendon 2004) includes: (i) the palm presentation gestures; (ii) the palm addressed gestures; and (iii) the lateral palm gestures. These co-speech gestures are said to be pragmatic gestures (Kendon 2004), as they contribute to the meaning of the utterance in fulfilling a modal (e.g. by intensifying the expressive content), a performative (e.g. by highlighting a question), or a parsing function (e.g. by marking the discourse's structure) in combination with the verbal utterance and its context. Pragmatic gestures, in the same manner than verbal pragmatic markers (Aijmer & Simon-Vandenbergen 2011) are also said to be multifunctional: for instance, one single palm-up gesture can at the same time have a modal and a parsing function (see Ferré 2011). Research on palm-ups in SLs is mostly based on Kendon's (2004) work, whose palm-up functions have also been found in some of the SLs studied (Engberg-Pedersen 2002; Colin *et al.* 2003; Kooij *et al.* 2006; Zeshan 2006; Halvorsen & Guri 2011; van Loon 2012; McKee & Wallington 2012). These functions include the expression of modality, backchannel signal, addressee's involvement, turn initiating or ending, and pause filler. Some palm-ups seem to have undergone grammaticalization from gesture into SL, making them liable to be used as connective, negative marker or question particle, among other possibilities (van Loon 2012).

As stated in Kendon (2004: 265), the more extensive and salient the nonmanuals are, the more expressive the information conveyed by the gesture may be. In line with this view, the present paper will study the use of palm-ups and the co-occurring nonmanuals in both Belgian spoken French and French Belgian Sign Language (LSFB). To the best of our knowledge, only McKee & Wallingford (2012) propose a first table of comparison between a SL and a SpL. Our purpose is to go a step further by: (i) comparing the frequency of palm-ups per minute with regard to the number of signs in LSFB and to the number of words and gestures in spoken French, (ii) studying the alignment of the palm-ups with nonmanuals in scope and timing in both modalities, (iii) investigating the nonmanuals that are layered with palm-ups in order to see the functions that such combinations fulfill in each language, (iv) carrying out the first cross-linguistic study on the use of palm-ups between a spoken and a signed language

in elderly people; and (v) building an interoperable model for the annotation of pragmatic gestures and their functions in both SpL and SL.
The approach is a corpus-based method of video data analysis (using the ELAN software) and follows from a form-based approach to gesture and sign. The corpus data comprise four samples of (audio and) video data (duration: approx. 20 min.) that are made up of interviews with two hearing French-speaking women (75 and 84 y. old; CorpAGEst corpus) and two deaf LSFB-signing men (75 and 84 y. old; LSFB corpus). The data are elicited through face-to-face interviews with a family member in SpL (task: talking about some major steps of aging in their past life) and with a moderator in SL (task: explanation of a past memory).
The underlying main hypothesis is that there would be an imbalanced use of manuals and nonmanuals between the four speakers, as well as differences in terms of scope/alignment and timing of the nonmanuals layering palm-up gestures (see Herrmann & Steinbach 2013), to convey similar pragmatic meaning in use. In particular, we expect more structuring, expressive and interactive nonmanuals than pragmaticalized gestures in the two oldest people, as well as a less strict alignment of nonmanuals and palm-ups in their interactions, taking for granted that there is an increasing need for a certain gestural economy with advancing age (Feyereisen & Havard 1999) (due to age-related physiological and cognitive changes, such as arthritis or the slowing of information processing).

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Nonmanual actions at the interface between gesture and sign: The meaning of facial expressions for hearing and deaf

Nina-Kristin Pendzich (Göttingen) & Annika Herrmann (Göttingen)

Studies on sign languages have long focused on providing evidence for the grammatical status of manual signs and nonmanual elements. Since this has become an undeniable fact, the gestural origin of manual and nonmanual features and the gesturing of signers are now more and more taken into account (Wilcox 2004; Özyürek 2012). Nonmanual actions articulated by the body, head, and face fulfill various functions, either as gestural elements or as linguistic markers operating on all levels of sign language grammar. Thereby, two characteristics are particularly decisive: nonmanuals are multifunctional and they may simultaneously combine with manual components as well as with further nonmanual features (Wilbur 2000; Pfau/Quer 2010; Herrmann/Steinbach 2013).

In the visual-gestural modality as well as in the vocal-auditory modality, nonmanuals may express emotions, attitudes, and reactions. However, a striking contrast between signers and speakers is that the former mainly use the face to nonmanually gesture and the latter predominantly apply acoustic gestures, the tone of voice, and intonation to express affective information in the broadest sense (Emmorey 1999). As only signers also use nonmanuals for lexical and grammatical functions, we ask whether this has a general effect on the perception of facial expressions in hearing and deaf people. Another important point is the fact that single gestural elements can be used without an accompanying signed or spoken word. It is possible, for instance, to communicate on the gestural level just by a smile. Grammatical and lexical nonmanuals, on the other hand, usually need to have a manual host that they align with. In this talk, we present an empirical perception and meaning attribution study on emotional and linguistic facial expressions, which is based on our aim to get a clearer view on the following three issues:

i) Do deaf signers perceive facial expressions differently than hearing speakers?
ii) Do emotional/gestural facial expressions have the same meaning for hearing and deaf? Is the interpretation of emotional/gestural facial expressions influenced by sign language grammar?
iii) Which meaning attributions do grammatical and lexical facial expressions get when observed separately from manual signs? Are they different for hearing and deaf subjects? Are the meaning attributions for deaf signers more consistent and is there a clear connection to the linguistic system of these facial expressions?

Our perception study on the meaning of facial expressions is based on an online video questionnaire. So far, 12 deaf persons (8 women, 4 men) between the age of 20 and 67 and 12 hearing persons (8 women, 4 men) between the age of 22 and 53 participated. The study investigates the meaning of muscle activations in the lower and upper face by presenting video stimuli with different facial expressions articulated by a deaf informant. In the questionnaire, the participants were instructed to label the meaning of 33 facial expressions. For the stimuli, two conditions are decisive: a) *emotional facial expressions* and b) *grammatical and lexical facial expressions*. The selection of emotional facial expressions follows Ekman (2003; 2010). Condition a) is represented by 8 Videos and condition b) by 24 videos. Three examples are illustrated in Figure 1. Both conditions are represented by stimuli with muscular activities only in the lower face, in the upper face, and in both. For comparison, we added one video with neutral facial expression. The stimuli videos always start with a neutral face followed by an increasing facial expression and end with the maximum of the facial expression. Videos showing fast movements such as an eye blink, return to a neutral face in order to be fully understood. All of the videos are randomized, have a duration of one to two se-

conds, and contain facial muscular activities according to the Facial Action Coding System (FACS, Ekman et al. 2002).

The pre-evaluation for two linguistic facial expressions by 3 deaf signers and 3 hearing speakers (see Figure 2) reveals that deaf signers attribute both gestural and linguistic meanings to isolated facial expressions whereas speakers unsurprisingly only associate gestural meanings to both affective and linguistic nonmanuals. First, this becomes particularly obvious regarding the meaning attribution for the stimulus *lip funneler / blow / lips part*. For deaf signers, this facial expression has the explicit link to the lexical sign OWN which is articulated with the demonstrated SCH mouth action in DGS. On its own, the facial expression directly activates a lexical entry, indicating that it is an inherent part of the lexicon in deaf natives. On the gestural level, hearing and deaf make similar meaning attributions. In both groups, the facial expression is labeled with *psst* which means *be quiet* and is often accompanied by a manual gesture. Signers gesture similarly to hearing people but most obviously systematically integrate gestures into their language system (Wilcox 2004; Herrmann/Pendzich 2014). Second, the meaning attributions for *raised eyebrows* are very interesting. Raised eyebrows as a gestural indicator of surprise, astonishment, and attentiveness, in many sign languages function as a syntactic marker of various constructions, such as topics, yes/no-interrogatives, conditionals, and relative clauses (Sandler/Lillo-Martin 2006; Cecchetto 2012). Looking at the meaning attributions in Figure 2, it becomes clear that deaf as well as hearing participants understand raised eyebrows as a marker for emotions such as surprise and wonder and as an interrogative marker.

The perception and meaning attribution study indicates that the same nonmanual features by deaf signers are typically used in both functions: gesture and grammar. Even isolated from the communicative context, facial expressions are associated with distinct gestural and linguistic meanings and trigger the access to the mental lexicon of deaf signers.

Figures:

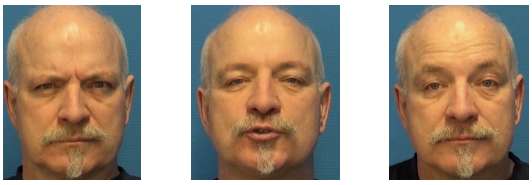

Fig. 1: Emotional facial expression *anger* (left), facial expression *lip funneler / blow / lips part* used on OWN and DARLING (middle), facial expression *raised eyebrows* (right)

Participants	**Stimulus: *Lip funneler / blow / lips part***	**Stimulus: *Raised eyebrows***
Deaf A	Do you have? (SCH)	Pardon?
Deaf B	Psst	Surprised or aha
Deaf C	Sch...	Eye brow raised / attentive („really?“)
Hearing A	Narrating	Wonder
Hearing B	Psst / be quiet	Oh yes? Are you sure?
Hearing C	Pssscht ... but somehow not good to assign	Really?

Fig. 2: Pre-evaluation of meaning attributions for two linguistic facial expressions of DGS

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Hand-mouth integration in comprehension: The role of mouthings in British Sign Language (BSL)

Pamela Perniss (Brighton), David Vinson (London) & Gabriella Vigliocco (London)

The use of manual and nonmanual articulators in sign languages means that comprehenders need to integrate the visual information they get from a signer's hands, body, head and face in real time. But fairly little is known about how comprehenders achieve successful integration, and about the roles played by different articulatory channels in comprehension. The present study investigates the interplay of hands and mouthings in comprehension of lexical signs in British Sign Language (BSL). Mouthings are those mouth movements visually resembling articulation of words in a surrounding spoken language (e.g., Boyes Braem & Sutton- Spence, 2001). Although some mouthings serve to disambiguate otherwise similar signs (e.g. BSL AUNT/BATTERY which only differ in mouthing), they are also very frequently produced for unambiguous signs (e.g. 69% of all signs in a BSL corpus: Sutton-Spence, 2007), and thus seem to function differently from other kinds of nonmanuals in not contributing independent meaning.

As such, the linguistic status and consistency of production of mouthings accompanying manual signs has long been a question of contention among sign language researchers. Systematic and in-depth investigation of these questions has been made possible recently through the greater availability of large sign language corpora. Studies of different sign languages have shown apparent variation in the consistency of use of mouthings (e.g. Bank, Crasborn & van Hout 2011 find high consistency in Sign Language of the Netherlands (NGT); Johnston, van Roekel & Schembri 2015 find low consistency in Australian Sign Language (Auslan)). Moreover, some consider mouthings to be fixed forms fully integrated into the sign lexicon; others argue that they should be considered code-blends - expression of spoken language elements simultaneously with the signed language. In production, Vinson et al. (2010) showed that spontaneous errors dissociate for hands and mouth, suggesting that mouthings are driven by spoken language lexicon. Consistent with this, in an fMRI study, Capek et al (2008) found that signs with mouthings activated superior temporal regions similar to activation patterns for speechreading.

Given variability in the occurrence of mouthings, and the possibility that they may reflect supplementary articulation from a spoken language, we ask how mouthings affect comprehenders. Are mouthings obligatorily integrated in comprehension? Do they have different influence on comprehension for deaf and hearing signers? We conducted two experiments to address these issues, using BSL signs referring to concrete objects. We employed a picture-sign matching task, using clips of BSL lexical signs with congruent and incongruent mouthings, achieved through digital manipulation, as illustrated in Figure 1.

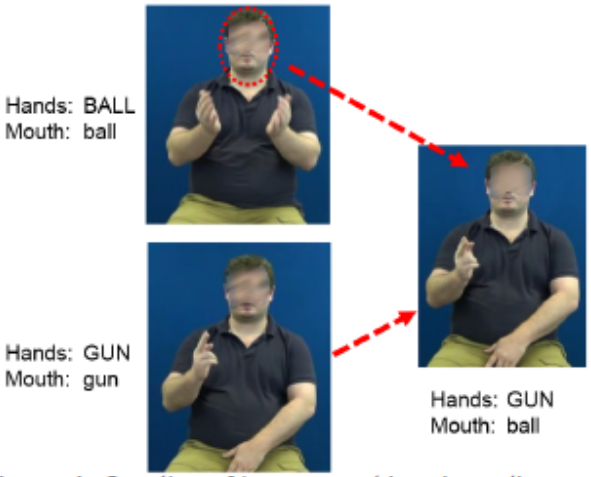

Figure 1: Creation of incongruent hand-mouth stimuli. BSL model's face is blurred for anonymous review; it was fully visible in stimulus materials.

Experiment 1 tested whether mouth-

ings are obligatorily integrated, by using a task in which mouthings were irrelevant. Native signers (16 deaf; 10 hearing) were presented with a picture and then a video clip, and were asked to indicate via button press whether the hands matched the picture. Experimental trials (n=72) were those in which the hands matched the picture, either with congruent or incongruent mouthings. For filler trials, the hands did not match the picture. Participants were less accurate when the mouthing was incongruent with the manual sign (Figure 2), and the pattern of results did not differ for deaf and hearing participants. Even though mouthings were explicitly irrelevant to the task, participants were unable to completely ignore them, suggesting that mouthings are obligatorily integrated in sign comprehension.

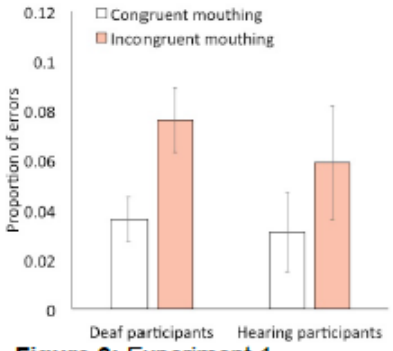

Figure 2: Experiment 1.

Experiment 2 sought to examine the relative contribution of hands and mouth in comprehension, using a similar task in which both cues are relevant to responses. Again we employed a picture-sign matching task, but this time participants were asked to respond "yes" if either hands or mouth matched the picture. Native signers (3 deaf; 3 hearing) showed an incongruence cost for both cues (accuracy is highest when both hands and mouth match the picture), but in a highly asymmetrical way: the manual component is a much stronger cue than mouthing (Figure 3). The pattern of results did not differ for deaf and hearing participants. (Data collection is ongoing for Experiment 2.)

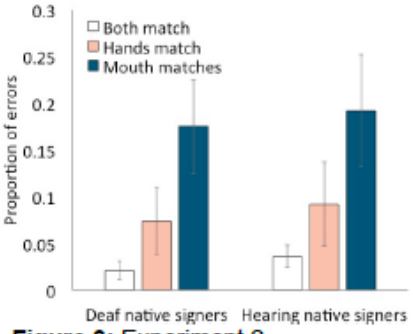

Figure 3: Experiment 2.

Overall, the results indicate that signers pay attention to mouthings and cannot help but integrate them in comprehension, despite variability of mouthings that sign comprehenders may experience. Furthermore, mouthings appear to supplement the information available from the manual channel; hands are a more reliable cue to meaning than mouthings. These findings contribute a piece to the puzzle of understanding the nature of different types of non-manuals in sign languages and their functional role in language processing.

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When old claims meet new data: A corpus study of WH-nonmanuals in ASL

Ronnie Wilbur (West Lafayette)

Claims regarding the nature of wh-question marking in the literature were compared to a corpus specifically designed to study nonmanual marking (NMM) in ASL. Productions collected from 25 deaf L1 ASL signers were filmed with two cameras, one regular and one close up on just the face. A specially trained cadre of L1 and L2 ASL signers annotated the data in ELAN, with more detailed mouth analysis conducted for a subset of 15. This presentation reports details of the NMMs on types of wh-questions in ASL: argument and adjunct; in situ and moved, and doubled.

There has been a debate between Neidle (2002) and Petronio & Lillo-Martin [PLM] (1997) concerning the syntactic structure, the direction of movement (Leftward: PLM; Rightward: Neidle), and the source and spreading of NMs ([+WH] feature is in Spec CP on the right: Neidle; [+WH] is in C on the right: PLM).

To address this debate, from our data we identify a primary NM, brow lowering, which appears crucial to the WH-question grammaticality, and a number of secondary NMs, which have until now either been bundled into a generic description (e.g. Wh-question face) or ignored completely.

The debate centers around (1) whether NM intensity is higher on WH-signs on the right because they are the source of the NMM or due to focus; (2) if they are the source, then there is obligatory leftward spreading, but if NM is due to focus, spreading should vary, (3) in doubled constructions, there is a break for the NM marking between the initial WH-sign and the final WH-sign, and apparent optional spreading throughout is really 'harmony' (Neidle) or the break is ungrammatical and spreading is obligatory (PLM).

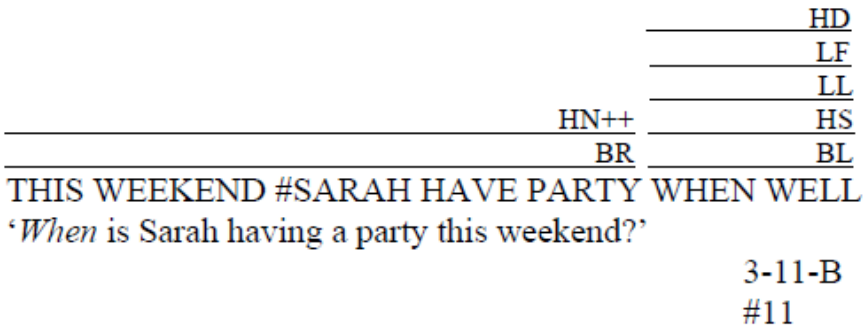
Data confirm that brow lowering is the primary NMM for WH- questions. Other NMMs with WH-signs in-situ and postposed showed expected scopal behavior. But the intensity patterns (both intensification of a NM or stacking of multiple NMs) of in-situ and postposed WHs and the scope and intensity of doubled WHs are not as expected. Thus, neither set of predictions is totally confirmed.

We can report that (1) the NM pattern depends on what the WH-sign is (and only marginally on the phonology of that sign, so e.g. a tendency for head down or chin out with WHO made on the chin); (2) it matters whether the WH-sign is in situ or moved; (3) it matters whether the WH-sign is doubled, as well as whether it is the first (initial) one or the final one; and (4) it matters whether the WH-sign is an adjunct or argument. A typical example has brow lowering across all or most of the production, with differing amounts of 'stacking' of secondary NMs at or near the end regardless of WH-position, indicating sentence final prosody in addition to whatever syntactic and semantic interactions are occurring (Ex.1). In doubled constructions, the second WH-sign always has the same or more additional NMs as the first (initial) WH-sign.

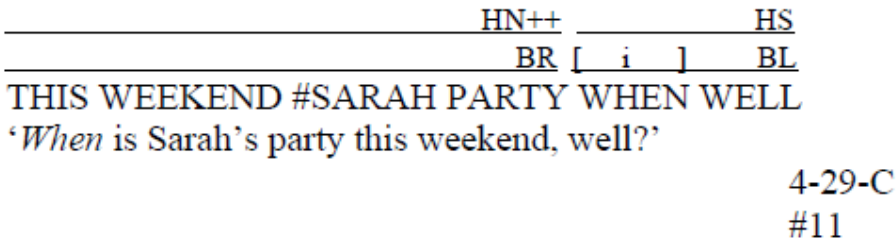
Several new claims also arise from the data analysis. One is the semantic use of Head Up and Head Down for indefinites and definites, respectively. Head Up seems to conform to the observation made by Barbera (201X) for Catalan Sign Language that higher signing space was associated with indefinite reference. For example, a straightforward request for information with WHO might have head down or neutral depending on the prior context, but if the intent is 'whoever' then the sign WHO is accompanied by Head Up. Similarly, we note that with the sign WHEN for future time, head position seems to move forward along the timeline, with both Lean Forward and Chin Out. This suggests further investigation is necessary for WHEN in both present and past uses, which were not included in our corpus. Finally, we observe

Head Shake over WH-constructions in both positive and negated sentences. To our knowledge, this is a novel observation that awaits explanation.

Ex. 1: Stacking



Ex. 2 Intensification



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When facial expression is easy and hard: L1 vs. L2 learning effects on affective and linguistic facial expression[14]

Rachel I. Mayberry (San Diego)

Sign language is expressed through two channels, the manual channel of the hands and arms, and the non-manual channel of the head and face. Facial expression in turn serves two communicative functions in sign language, affective and linguistic, and these dual functions are observed cross-linguistically.[1-3] From a neurolinguistic perspective, linguistic facial expression is localized to the left hemisphere in adult signers, while affective facial expression is localized to the right hemisphere.[4] Right hemisphere damage leads to impaired affective facial expression, but spares linguistic facial expression. Conversely, left hemisphere damage leads to absent or dampened linguistic facial expression, sometimes sparing manual expression.[5,6] This double dissociation of linguistic facial expression from affective facial expression and manual expression is further observed developmentally. Mothers favor affective facial expressions over linguistic ones when signing to their young children. Children acquire grammatical structures first through the manual channel, initially signing grammatical structures without linguistic facial expression. Over time children learn to coordinate the scope and timing of the required linguistic facial expression with the manual production of grammatical structure.[7]

Although we know a great deal about how linguistic facial expression functions in sign language, we know little about how a late onset of sign language acquisition affects the learning of linguistic facial expression. Sign languages are learned as second languages, L2, at a variety of ages after birth. Unique to the population of deaf signers is the fact that some individuals learn little or no language prior to learning sign language. Whereas late L2 learners often achieve near-native levels of sign language proficiency and show typical patterns of brain language processing, the sign language proficiency levels of late L1 learners, and their brain language processing patterns, are negatively associated with the duration of their language deprivation in childhood.[8-10] The question we ask here is whether these findings from the manual channel generalize to the non-manual channel.

We studied the use of linguistic facial expression in two kinds of late learners: deaf L2 learners of ASL (n=4), and deaf L1 learners of ASL (n=3). If the learning of linguistic facial expression parallels learning via manual expression, then the late L2 signers would be expected to show near-native proficiency in their use of linguistic facial expression. By contrast, the late L1 learners could show two patterns. Their learning could parallel that of young L1 learning children and follow the “hands before face” principle.[7] This would be consistent with the finding that the initial stages of late L1 acquisition look “child-like” in the manual channel.[11] Alternatively, they could show learning patterns of linguistic facial expression that are unique. This could arise from their childhood reliance on affective facial expression for communicative meaning in the absence of language.[12,13] We used a sentence imitation task and a picture description task to elicit a variety of ASL structures from the learners. Relative to a control group of deaf native signers, the L2 learners produced the ASL structures with a high degree of accuracy across both manual and non-manual channels. The late L1 learners showed patterns similar to young ASL children and unique ones as well. Like young ASL learning children, they often produced an affective facial expression mirroring the meaning of one sign in their utterance, such as frowning while signing SAD. This kind of affective/lexical facial expression was rarely observed in the L2 or native learners. Some late L1 learners displayed affective facial expressions indicating their assessment of their performance, whether they were signing correctly. Other late L1 learners showed an awareness that a linguistic facial expression was required, but were unable to produce the correct one or coordinate it

with their signing, as in adding an incorrect expression at the end of an utterance, or inserting an incorrect expression mid utterance. One late L1 learner approached the problem by using no facial expression of any kind. The expressive data will be compared with the learners' comprehension of the same structures. The results will be discussed with respect to how they inform the plastic nature of language learning in early childhood.

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The prosodic characteristics of imperatives in ASL

Diane Brentari (Chicago)

Imperatives stand at the crossroads between pragmatics and semantics, insofar as they are a function of several clause types (Kaufmann 2012) and have been analyzed by some as indirect speech acts (Sadock & Zwicky 1985). The crosslinguistic study of imperatives in sign languages has been the focus of the COST SIGNGRAM initiative (Donati et al 2014), and the analysis presented here adds results from ASL to that endeavor. In this study we pay particular attention to the prosodic cues — both manual and NMMs — that are important for identifying 4 different types of imperatives (command, explanation, advice, and permission) as they are produced and perceived in ASL. Since commands and explanations are typically associated with universal quantification, while advice and permission are typically associated with existential quantification, we also ask if the structural patterns in prosody align with these semantic distinctions.

Production: 4 Deaf signers who were native or early learners of ASL participated (age 34, 50, 54, 60). The following method was employed to elicit productions of the 4 imperative types. Contexts were provided for the 4 types of imperatives. All elicited sentences contained 2 words; the first was a monosyllabic verb containing path movement, and the second was a noun typically produced via reduplication (e.g., THROW PAPER, KEEP BOOK, FIND WATCH). Each signer produced 32 sentences in each of the 4 imperative types plus a set of neutral sentences, controlled for form (160 sentences). Productions were annotated for 3 manual cues (sign duration, transition duration, hold duration), and 6 NMMs (head nod, head tilt, body tilt, eye behavior, lower face, and mouthing). The results of this analysis (Figure 1) show that there are indeed different prosodic cues for each of the four imperative types that include both manual and NMMs. We also analyzed the productions for whether cues continued across the whole clause domain or changed within that domain, and found that advice and permission imperatives had more cue changes between the two words of the clause, while the cues in commands and explanation imperatives were more likely to extend across the whole sentence domain.

Perception: The productions of one native signer were chosen to provide the stimuli for the perception experiment. 11 signers (age 18-65) who were native signers or early learners of ASL participated in an online perception task to determine which imperative types were identifiable through prosody alone. 80 items were selected from the 160 from the production study, and presented via a multiple choice and a matching experimental paradigm—40 items in each section. Responses were very consistent across subjects, and showed that commands and neutral clauses were easiest to identify, followed by permission (Figure 2). Explanation and advice imperatives were identified at a rate that did not differ significantly from chance. These results suggest that even if all 4 imperative types are distinguishable from one another in production they are not all equally readily perceived via prosody alone.

Discussion and Implications: Several findings from these investigations are important, and

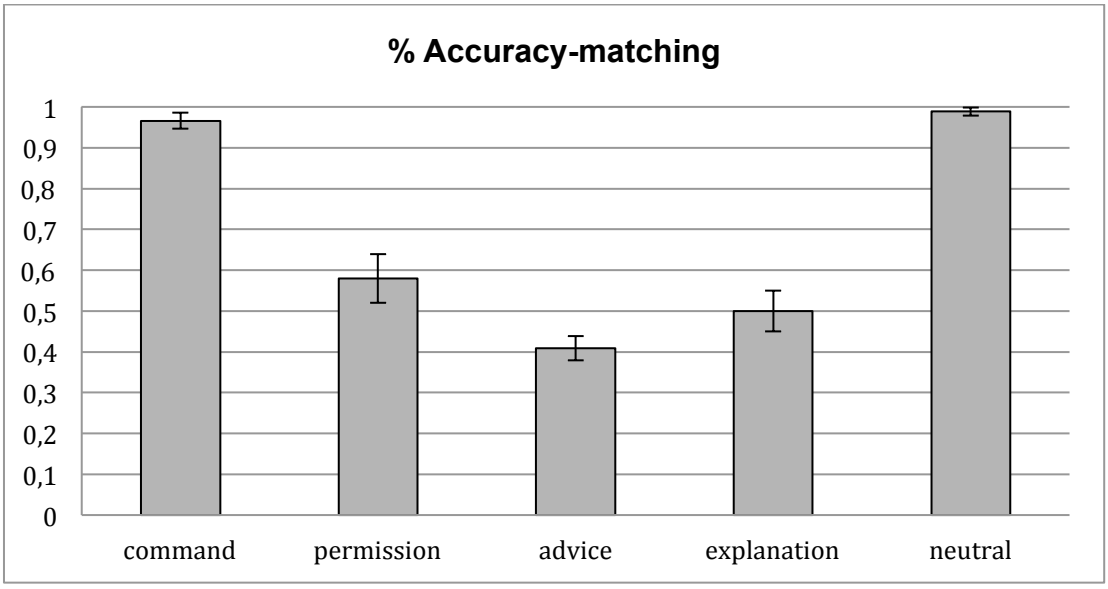
1) It is important to use both production and perception data to describe the nature of imperatives.
2) Both the content and distribution of prosodic cues are relevant for identifying imperatives in ASL.
3) In terms of prosodic domain it appears that the cues for commands and explanations spread across the whole sentence, while those for advice and permission (those associated with universal quantification) may have a more restricted domain.

4) It would appear that commands and permission behave more like sentence types, while explanation and advice require more pragmatic or linguistic context in order to be identified.

Figure 1. Production patterns for 4 types of imperatives and a set of neutral sentences

	command	permission	advice	explanation	neutral
sign duration	266	326	322	364	422
hold duration	90	104	106	141	101
trans. duration	195	231	233	257	262
head nod	0.18	0.76	0.56	0.43	0
head tilt	0.5	0.61	0.63	0.5	0
body tilt	0.13	0	0.24	0.34	0
eyes wide	0.47	0.14	0.33	0.44	0
lower face	0	0.26	0.03	0.09	0
mouthing	0.97	0.98	0.94	0.97	0.56

Figure 2. Perception patterns for 4 types of imperatives and a set of neutral sentences (11 participants).



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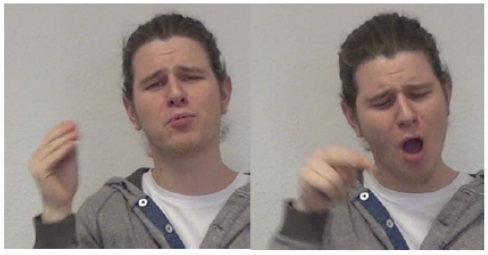
Nonmanuals in context of constructed action: A comparison of childs and adults narratives signing

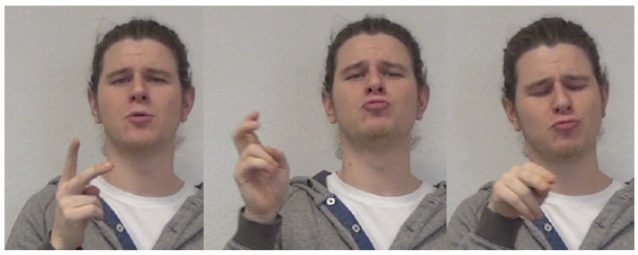
Bengt Förster (Berlin)

Narratives consist of different elements to build a cohesive structure. One of the important elements is the possibility to distinguish between the observer's perspective (op) and the character's perspective (cp) (Zwitserlood 2011, Perniss 2007, Förster 2014).
Narratives in sign languages make use of constructed action as a formal means to mark character's perspective. By contrast, descriptions of events, relations between characters, and topographic relations between entities and characters belong to observer's perspective. To mark a shift from observer's perspective to a character's perspective, specific nonmanuals such as change of facial expression and eye gaze as well as body shift and head movement are crucial tools as is illustrated in the examples below.
In this presentation it will be shown that facial expressions are a crucial part of the nonmanuals marking context shift in constructed action (CA). The focus is on shifting to CA. In DGS (Deutsche Gebärdensprache / German Sign Language) facial expressions can be analyzed as grammatical / prosodic markers and they have a perspectival function.
In recent research nonmanuals have been described with grammatical and prosodic function. In this presentation I will focus on the following two questions: (i) What is the relation between prosody and perspectivity and (ii) which elements trigger the context shift in CA?
In an empirical study, I explored the narrative development of Deaf pupils in two time points. The age of the pupils has been 8;8 to 12;7. Their task was to retell a picture story in DGS. A comparison of children and adults narrative signing indicates different uses of nonmanuals in the context of CA.

Two examples:



BOY (op) | LOOK-AT (cp)



BOTH (op) | SITTING (op?) | LOOK-AT (cp)

Nonmanuals in TİD comparatives: Grammatical or gestural?

Hüner Kaşıkara (Istanbul) & A. Sumru Özsoy (Istanbul)

This study focuses on the function of nonmanuals in comparative constructions in Turkish Sign Language (TİD). In TİD, nonmanuals have been argued to be functional at phonological, morphological and syntactic levels (Kubuş 2008, Zeshan 2004). As observed by Kubuş (2008,3), at the lexical level, the sign YANLIŞ 'wrong', for example, is coarticulated with 't he facial expression of "furrowing the eye brows" which transports a message of "unwillingness to do this". At the syntactic level, Zeshan (2003, 2004) revealed the significance of nonmanuals in syntactic structures expressing negation and questions. It is therefore of great significance to determine whether the nonmanuals observed in relation to a particular construction of a sign language have grammatical significance or whether they are gestural in nature, similar to the gestures in spoken language.

Ever since Bresnan's (1973) influential study on comparative constructions in English, comparative constructions of spoken languages have been the subject of semantic (Klein 1980, Larson 1988, Kennedy 2008), morphosyntactic (Dixon 2005), syntactic (Napoli 1983, Osborne 2009, Liu 2011) and typological (Stassen 2013, Dixon 2008) investigations. Regarding the comparative construction in TİD, we have identified two distinct strategies which we label as (i) conjoined comparatives (13), and (ii) locational comparatives (47) following Stassen's typology.

The conjoined comparative construction consists of two structurally independent clauses, one of which contains the Standard NP, and the second the Comparee NP. The two clauses exhibit structural parallelism in that the two terms of comparison have the same grammatical function in their respective conjoined clauses, i.e. both function as the subject of their respective clause. The direction of comparison, i.e. whether the comparison expresses superiority ('more') or inferiority ('less') is implicit in the semantics of the two predicates, where the direction of the comparison is encoded in the manual sign of the second predicate, coarticulated with the lexical facial expressions.

The second strategy, the locational comparative construction, is distinguished by the presence of a single predicate expressing the attribute shared by the standard NP and the comparee NP, where the two NPs are located in the signing space by means of indexing. The optionality of indexing in locating the compare NP, in contrast to the obligatoriness of body shift in the direction opposite to that of the standard NP, indicates that body shift is a grammaticalized element of the comparative construction in TİD. The Comparative IX, IXC OMP, p roduced by the arcmovement of the dominant hand from the Rlocus of the standard NP to that of the comparee NP relates the two participants of comparison through the directionality of the hand movement. In the production of IXC OMP, eye gaze is shifted simultaneously with the movement of the hand from the Rlocus of the standard NP to that of the comparee NP where the manual sign of the predicate is formed.

With respect to encoding of the degree/extent of comparison, TİD uses two means to express the *comparative* and *superlative* degrees of adjectives. Lexically, TİD employs two manual signs – *MORE, MOST* – to express the two levels of gradability in a comparative construction. With morphologically marked adjectives, on the other, the degree/extent of comparison is expressed through a morphological process whereby the degree is incorporated/fused into the sign of the adjective.

The nonmanual markers observed in comparative constructions are open/squinted eyes and raised/furrowed eyebrows. Increasing degree is expressed by open eyes and raised eyebrow, decreasing degree by squinting eyes and furrowed brows. In contexts in which the predicate has lexical nonmanual marking, the nonmanual marking of comparison overrides

lexical nonmanual marking indicating that nonmanuals are grammaticalized elements in the structure of TİD.

Data:

(1) THIS COAT CHEAP THAT COAT EXPENSIVE
'This coat is cheap. That coat is expensive.'

(2) eo
br
THE RED COAT EXPENSIVE. THE BLACK COAT MORE.EXPENSIVE.
'The red coat is expensive. The black coat is more expensive.'

(3) es eo
fb br
JACKET RED PRICE CHEAP BLACK MORE.EXPENSIVE.
'The red coat is cheap. The black coat is more expensive.'

(4) eo
br
HER BOY IX_i YOUR BOY IX_j $_iIX_{COMPj}$ BIGGER
'Your boy is bigger than her boy.'

(5) eo
br
IX_a THE RED $COAT_a$ IX_b THE BLACK $COAT_b$ $_aIX_{COMPb}$ MORE.EXPENSIVE
'The black coat is more expensive than the red coat.'

(6) eo
br
2 BALL. $GREEN_a$ IX_a $BLUE_b$ $_aBIGGER_b$.
'There are 2 balls. Blue ball is bigger than the green ball.'

(7) GREEN $PEPPER_a$ IX_a $_aIX_{COMPb}$ RED $PEPPER_b$ MORE HOT
NDH: IX_a
'Red pepper is more hot than the green pepper.'

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Nonmanuals in sign languages as models of linguistic evolution

Donovan Grose (Hong Kong)

The lexical, grammatical and prosodic behaviors and functions of nonmanuals (NM) clearly distinguish them from the non-linguistic gestures of the face, head and torso from which they evolved. This proposal presents an evolutionary analysis of NM in order to address the questions of how these elements come to be recruited and incorporated into linguistic systems (*linguistic capture*), how new NM spread (*flow*) and how they come to be conventionalized (*fixed*) within a language community (*linguistic population*). For several reasons, NM provide an especially clear window into these mechanisms, allowing NM to serve as models of linguistic evolution generally. Building from Ritt (2004), this analysis has two components: First, the proposal of four linguistic selective pressures relevant for the evolution of NM; and second, the identification of specific linguistic *replicators* that evolve under selective pressure, as distinct from broader cognitive and linguistic competencies. Research has identified a broad range of individual NM, some of which behave similarly across sign languages and others that have evolved languagespecific behaviors and roles (Pfau & Quer, 2010). All of these NM and their roles can be unified under an evolutionary analysis as having evolved in the same language modality under the same selective pressures, but the later group is more interesting because it is from this group that specific NM can be identified with individual replicators (i.e. [brow furrow], [brow raise] and [neg-headshake] in ASL). Four universal selective pressures are distinguished here as relevant for the evolution of NM: the need to constrain interpretation (NCI); the need to constrain syntactic and prosodic parsing (NCSP and NCPP respectively); and the need to reduce variability (NRV). These pressures emerge naturally from the more general need to communicate as reliably, effectively and efficiently as possible, and operate by selecting those utterances or components of utterances that are more adaptive, or better at fulfilling one or more of these needs over their possible competitors. Any gesture or proto-NM will be selected for and potentially captured by linguistic systems if it happens to be adaptive relative to these selective pressures. Some gestures are pre-adapted for linguistic functions. Periodic eye-blinks and gestural headshakes will frequently co-occur in contexts where, under selective pressure they are likely to be captured: under NCCP pressure eye-blinks, necessary to wet the eyes, are timed to coordinate with prosodic boundaries; under NCI and NCSP pressure, the ASL [neg-headshake] evolved so that it spreads over and thus marks ccommand domains. Under NRV pressures, variability in both of these NM is reduced over time, and these NM become increasingly conventionalized or fixed. The same mechanisms apply to the capture and fixation of [brow furrow] and [brow raise], despite appearing less pre-adapted for the current roles in ASL. The roles of these two NM and the domains that they mark are semantically incompatible (Wilbur, 2010), but marking them significantly constrains interpretation and parsing. Under NCI, NCSP and NCPP pressure any proto-NM that happened to mark these distinct domains would be selected for, and even stronger selection would apply to any NM system that distinguished the wh-question domain, now marked with [brow furrow] from those of yes/no questions, topics, if/when- and relative clauses, now marked with [brow raise].

NCI, NCSP, NCPP and NRV operate directly on linguistic performances, but they drive the evolution of linguistic competencies and individual replicators, and some NM like [brow furrow], [brow raise] and [neg-headshake] meet criteria for linguistic replicators. These can be contrasted with NM that do not replicate or evolve as individuals such as prosodic [eyeblinks] and pragmatic [body leans]. Replicating NM are relatively stable entities that are learned as units and are individually under selective pressures. They are thus similar to lexical items, and developing from Jackendoff (2010) can be decomposed into phonologi-

cal/prosodic, morphosyntactic and semantic/pragmatic components. When they are learned, replicating NM copy themselves into the mental lexicons of new individuals, and thus flow within the pool of mental lexicons that make up a linguistic population. Those NM that are better adapted given the relevant selective pressures replicate more successfully and outcompete their rivals, even to the point of fixation across the entire population, until a new competitor that is more adaptive displaces them. This sort of linguistic evolution can thus be defined as changes in the frequency of a replicator, in this case a NM, within a population over time (Ritt, 2004). The fact that NM in ASL and other sign languages display variation may be evidence that specific replicating NM is not, or not yet, fixed and still evolving. Prior to fixation some variability in the occurrence and function of NM is predicted, even if it is otherwise possible to develop coherent analyses of its prosody, morphosytnax and/or semantics/pragmatics. The nature of NM makes the mechanisms of capture, flow and fixation much more visible in sign languages than they are in the lexical items of spoken languages, even with a general lack of historical documentation for NM. However, because the same selective pressures apply to all linguistic replicators, insights into linguistic evolution revealed in sign languages may be applicable to language generally.

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Concatenation and layering across modalities

Daniel Hole (Stuttgart) & Fabian Bross (Stuttgart)

This talk investigates the manual and nonmanual encoding of scope-taking elements in German Sign Language (DGS). Our central hypotheses are that the scope-taking indicated by concatenation for lower operators switches to nonmanual suprasegmental facial operator expressions for higher operators, thereby establishing the vertical axis as a scopally relevant dimension: high operators are encoded high and low operators are encoded low. Applying a cartographic approach to clausal syntax (Cinque 1999), we make use of the empirical realm of epistemic, permission/obligation and root modals, combined with high evaluative categories and speech act categories to make our point. The data used for this talk includes sentences taken from the literature, the SIGNUM corpus (Agris & Kraiss 2007)[1] and elicited sentences from four signers. Our findings have repercussions for the comparison of DGS and spoken German on the one hand, and for a general theory of scope-taking in sign languages on the other. DGS, like spoken German, starts out with low right-headed clausal categories, then switches to scope-taking expressions that take scope from left to right, before ordering on a metaphorical vertical axis with suprasegmental high operators kicks in. We contend that it is a universal of sign languages to encode high operators in high positions, such that a language which, to give an example, encodes deontic modality above the articulator for speech act categories is predicted to be impossible.

Modals used for expressing permission/obligation and circumstantial modality commonly appear in a sentence-final position in DGS as is shown in (1). They are in the lowest position in our selection of categories from Cinque's hierarchy, depicted grey in Figure 1, and are marked with a manual right-headed modal.[2] Despite the fact that modals usually appear sentence-finally, they can sometimes be found in a position before the main verb, i. e. a left-to-right-concatenation strategy to signal scope-taking is used. This is true in particular for signs expressing volition like the verbal signs wish and plan, as illustrated by (2), taken from Happ & Vorköper (2014:362).

In DGS, epistemic modality may not be expressed by modal verbs alone (Hermann 2013:112; Happ & Vorköper 2014:362). Such modal verbs uses combine with nonmanual markings, often accompanied by sentence-initial sentential adverbs like possibly or surely. The degree of certainty can additionally be expressed by slow head nods, a forward head tilt, a shrug and by closed eyes. Nonmanuals to express epistemic uncertainty are exemplyfied in (3), taken from Happ & Vorköper (2014:363). As in ASL, the intensity of commitment can be expressed by sharper and shorter manual movements (Wilcox & Shaffer 2006).

In Cinque's (1999) cartographic account, evaluation is located directly under speech act categories. As would be expected given our hypothesis, evaluation is marked nonmanually. In addition (sentence-initial) sentence adverbials like LUCKILY or UNFORTUNATELY are used. These sentence adverbials are accompanied by a specific lexical facial expression, with the nonmanual marking used to indicate the evaluative meaning spreading over the whole sentence, as can be seen in sentence (4), taken from Happ & Vorköper (2014:366). As in other sign languages, speech acts different from assertions are marked nonmanually in German Sign Language (Zeshan 2006; Herrmann & Steinbach 2013). Typically, the nonmanuals spread across the whole sentence. That high operators are articulated high, i. e. with the face and head, mirrors their importance in coding grammatical informations and fits in well

[1] The corpus' PID is 11858/00-1779-0000-0019-8A9A-2 available via http://hdl.handle.net/11858/00-1779-0000-0019-8A9A-2.

[2] Please note that the example sentences align with the tree structure summarizing our hypothesis.

with the fact that signers typically focus on each other's faces, not on each other's hands during conversations (Swisher, Christie & Miller 1989). We chose a yes/no question which is accompanied by raised brows as an example; see (5). The fact that speech act indicating nonmanuals (partially) coincide with evaluation markers in DGS (both are produced with the eyebrows) is predicted by the cartographic perspective because it has long been known that adjacent heads on the clausal spine often receive identical expression in a natural language.

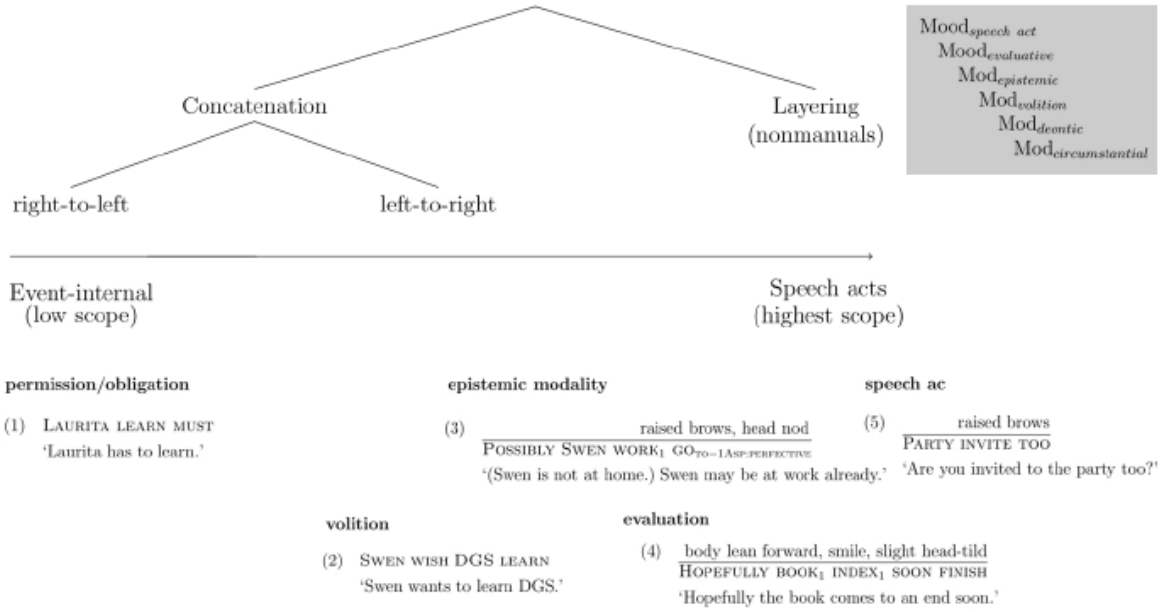

Figure 1: Concatenation and layering in DGS (note that the example sentences align with the tree representing our hypothesis)

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The contribution of nonmanuals to resolving local ambiguity in online processing of Austrian Sign Language (ÖGS)

Julia Krebs (Salzburg), Ronnie Wilbur (West Lafayette) & Dietmar Roehm (Salzburg)

This paper reports a previously unnoticed role for non-manuals in marking argument structure in ÖGS. While testing the processing of word order variations in ÖGS, we presented transitive ÖGS sentences counter-balanced across two orders (SOV vs. OSV) in an ERP-study, followed by a gating study. Although the basic sign order of ÖGS is SOV (Skant et al. 2002), in contexts with agreeing verbs (1) and agreement markers accompanying plain verbs (2), OSV is possible without special topicalization context or marking. Furthermore, to our knowledge, ÖGS does not have any marker that indicates an argument's syntactic function. Thus, sequences of two arguments appear to be locally ambiguous – either could be the subject. The experimental question is at what point this local ambiguity is resolved. We expected that this would be when verb agreement indicated the subject-object spatial relationships. In fact, this was not the case, as we found that the decision is made much earlier. In particular, the prior transition movement towards the disambiguating verb/agreement marker indicates argument structure. In addition, and more crucially for the present discussion, we found several non-manual markings that appear to have resolved the local ambiguity in a subset of the stimuli sentences. Prior research on non-manuals in ÖGS have focused either on mouth marking (Schalber 2006a) or standard non-manuals associated with common syntactic structures (polar and wh-questions; Schalber 2006b). Thus, the subtle head and body markers that cue the viewer as to which argument is the subject have not been previously identified.

Studies on spoken languages show that locally ambiguous argument structures are preferentially interpreted as SOV, such that ambiguous object-initial sentences have to be reanalyzed (the „subject preference"; e.g. Bornkessel-Schlesewsky et al. 2008). In our ERP-study, we observed very early disambiguation effects for OSV compared to SOV (N400 - late positivity ERP-pattern), namely before the verb. For plain verbs, the effect occurred when both arguments had been referenced and the index-hand which referenced the subject starts transition movement towards the agreement marker/agreeing verb. However, more crucially for this presentation, the effect for agreeing verbs was also bound to the time point when both arguments had been referenced by their index-signs in space. That is, the decision was made before the hands provided the overt subject agreement. The early time of disambiguation in ÖGS was similarly revealed on the behavioral level. In a gating study, a set of sentences from the stimuli used in the ERP-study was presented in successive prolonging gates to 14 deaf signers. The first ‚gate' was defined as lasting from video onset to the onset of the second argument („sign onset" was defined as the time when the phonological target parameters handshape and location were established). Each subsequent gate was prolonged by four frames (fps=29.97; time between two gates=133.5ms). After each gate the subjects had to indicate by button press which of the two arguments was the active one - most likely to be the subject. Data analysis revealed that for most sentences the mean ratings showed a significant drift towards the appropriate direction (e.g. towards OSV in case of OSV) after the gate in which the hand which referenced the subject started to move. Furthermore, in some items disambiguation was even earlier, at the time point when both arguments had been referenced in space, before overt hand agreement.

The results of these two studies led to careful re-examination of the stimuli in the time period prior to the critical hand movement. Stimuli were evaluated for handedness, duration of argument and index-signs, pointing height of index-signs, facial nonmanuals (e.g., brow raise, eyegaze direction, head tilt, head turn, body lean, shoulders) to determine what cues the

viewers might be seeing to indicate which was the subject. After eliminating many interesting but not systematic nonmanuals, it was determined that body shift/head tilt towards the subject position, eyegaze directed towards the object (Figure 1) led to disambiguation of some (but not all) items. These shifts accompanied the second argument and its corresponding index sign. Further, these nonmanual markings were observed for SOV- as well as for OSV-sentences. Thus, it seems that there is not one specific nonmanual marker, but rather a set of nonmanuals than can indicate grammatical relations even before the verb has been established. This observation contrasts with the theoretical assumption that the path movement and/or facing of the agreeing verb/agreement marker indicates the argument structure in sign languages (e.g. as far back as Friedman 1976). These findings, at the online as well as the offline level, underline the influence of nonmanual markings and the impact of parallel information through the layering of nonmanual and manual components within signing on sign language processing. The question of what status these nonmanual markings may have within ÖGS grammar, i.e. purely syntactic, prosodic or even pragmatic, has to be left open for further research.

Examples:

(1) GRANDCHILD3b IX3b GRANDMOTHER3A IX3a 3bVISIT3a (SOV) / 3aVISIT3b (OSV)
The grandchild visits the grandmother.

(2) GIRL3b IX3b WOMAN3a IX3a 3bAgrM3a KNOW (SOV) / 3aAgrM3b KNOW (OSV)
The girl knows the woman.

Notation conventions: Signs are glossed with capital letters; IX= manual index sign; AgrM= agreement marker; Subscripts (3a, 3b) indicate reference points within signing space.

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The interface between polarity and modality expressed non-manually in Austrian Sign Language (ÖGS)

Andrea Lackner (Klagenfurt)

When taking/signing about a factual status of propositions the speaker/signer also makes a judgement on the proposition. To be precise, when asserting/negating the factual status of proposition, the speaker/signer also implies positive/negative epistemic presupposition (Israel 2011).

In order to investigate the interface between coding negation/assertion and expressing negative/positive attitude towards a proposition the following study[3] was implemented: Nine Deaf native signers (of a variety of) Austrian Sign Language (ÖGS) were asked to sign lines of thoughts. In doing so, they should express the same lines of thoughts, first in an assertive way, then the lines of thoughts should be negated. Following this, the signers were asked to express these lines of thoughts with different attitudes toward the proposition/states of affaires. Afterwards, four of the recorded informants were asked to annotate the non-manual elements with regard to the form and the possible meaning or function. They had to annotate their own data and the recordings of three other informants. As final step, the annotations of the four Deaf annotators were compared.

The analysis of the annotations show that the annotators identified different head movements for (a) expressing clause negations, (b) being more likely convinced of the negative outcome of a line of thought, (c) expressing assertive clauses, and (d) being convinced of the positive outcome of a line of thought. Negation is coded by slow or fast headshakes which are performed with a uniform shaking movement while non-assertive epistemic attitude on a proposition is expressed by slow headshakes which tend to be small in size and which are performed in a rather tentative way. The latter are often accompanied by wrinkled nose and squinted eyes. Assertion is expressed by slow, intensively performed nodding movements or fast, small nodding movements while expressing being certain about (the positive outcome of) a proposition is expressed by fast or slow head nodding movements which are performed with a slightly forward rotating or a slightly forward movement. The latter is also frequently accompanied by the non-manual elements furrowed brows and lips forward.

The presentation will focus on these four head movements with regard to their formatives, functions, co-occurring elements, (semantic) scopes, and their interaction among each other.[4] Due to the production of the same non-manual elements and the strong accordance between the annotations of the four annotators conclusions on the linguistic/gestural status of these elements will be discussed.

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[3] The present study was part of a more comprehensive investigation on head and body movements in ÖGS (Lackner 2013).

[4] Findings of a recently implemented study on negation in ÖGS (Stalzer 2014) will be included in the discussion.

Nonmanuals of relative clause constructions in Turkish Sign Language and their functions in discourse

Okan Kubus (Hamburg)

Sign languages have a number of ways to mark relativization available to them (e.g. ASL (Liddell 1978), LIS (Branchini 2014), DGS (Pfau & Steinbach 2005). In relativization strategies in sign languages, lexical expressions may be used (i.e. relative pronouns in DGS, PE-sign in LIS and many others). However, most of these constructions are accompanied and marked by nonmanual components that play specific roles at different levels such as lexicon, morphology, syntax or prosody (see Pfau & Quer 2010). This presentation will outline the nonmanual components that are observed in relative clause constructions at different levels in Turkish Sign Language (TİD). Based on an empirical investigation of relativization strategies in TİD at discourse level, the usage of nonmanual markers for relativization does not seem to be fully systematic (see e.g. the discussion on nonisomorphism between prosody and syntax, Sandler 2010). However, there is also a tendency of syntactical marking of relativization. The competing data analyses will be presented and discussed. I claim that the nature of relative clause constructions are better understood at discourse level and that there might be a grammaticalization process in the direction of increasing syntactic marking of relative clauses.

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Poster Session

The nonmanuals of aspectual sandwich constructions: Gesture or sign?

Vibeke Bø (Oslo and Akershus)

Verb sandwiches were first described for American Sign Language (ASL) by Fischer and Janis (1990), who described them as constructions in which a verb appears twice: once in its sentence-initial position and again in the sentence-final position. For Norwegian Sign Language (NTS) (see example (1)) verb sandwiches have been described and syntactically analyzed (Bø 2010).

Following Matsuoka (1999), the sandwich constructions were divided in two subcategories, the Aspectual verb sandwich constructions and the Lexical verb sandwich construction. As the name of the former category implies, the last verb of both the Aspectual and the Lexical verb sandwiches is claimed to be assigned with an aspectual marking. This marking is to be found in the nonmanuals of the verb. For NTS, this nonmanual marking is found to be inconsistent (Bø 2010). Since phonology was not the focus of the study, the nonmanual aspectual marking was nevertheless assumed to exist in one way or the other, granted that the marking could be subtle. For this paper I investigate the actual nonmanual behavior of the Aspectual sandwich constructions, arguing that the nonmanuals of these verbs could actual be gestural rather than an aspectual marking.

The analyses of the nonmanuals of these verbs, will to a large degree depend on how the verbs are defined and analyzed. The verbs in question, are within the framework of cognitive linguistics, described as depicting verbs (Liddell 2003), constructed action (Winston 1991, 1992; Metzger 1995), or representing two different systems of grammar within NTS (Erlenkamp 2009, 2011). Applying cognitive grammar on these constructions, I argue that the verbs represent constructed action and can be described as mimetic gestural complements (Quinto-Pozos & Mehta 2009). Further, I argue that they represent a modality-specific interface between the gestural and grammatical domain (Schembri and Cormier in press).

The treating of these constructions as belonging to the gestural domain will in turn be able to shed lights on the syntactic puzzle of verb sandwich constructions; two instances of the same verb in one clause.

Example:

(1) IQ_{PRO} SEND SMS SEND-FROM-CELLPHONE[cl:handle][asp:cont]
'She sent me an SMS'

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Grammaticalization of facial intonation: The case of squint in ISL relative clauses

Svetlana Dachkovsky (Haifa)

Intonation is an interesting testing ground for theories of grammaticalization because, unlike the grammaticalization of affixes from words, linguistic intonation is thought to have grammaticalized from intonational signals that were not linguistic (Gussenhoven 2004, Janzen 1999 *inter alia*). Contemporary spoken languages cannot provide a testing ground for this hypothesis due to their old age. However, a young sign language, such as Israeli Sign Language (ISL), is perfectly suited to this purpose (Meir and Sandler 2008).

In sign languages, the functions of intonation are performed by facial expression (Sandler 1999), and the present study tracks the change of one intonational component squinted eyes – across generations of ISL signers. Previous work on ISL has shown that this signal appears mostly on topics and relative clauses, and is analyzed as an instruction to the addressee to retrieve information that is not readily accessible (Dachkovsky and Sandler 2009). The present study demonstrates that this signal starts as a pragmatic device for establishing shared information, and is transformed to a linguistic relative clause marker through grammaticalization.

Adopting Labov's (1963) apparent time hypothesis, which infers diachronic changes from synchronic data collected from different age groups, the ISL data were collected from three generations of signers through an interactive task designed to elicit relative clauses. Signers' facial articulations were coded with Ekman and Friesen's (1978/ 2002) detailed Facial Action Coding System.

In order to test the hypothesis that intonational components are grammaticalized across generations, the behavior of squint was analyzed according to **three diagnostic criteria for grammaticalization** (e.g., Hopper and Traugott 1993)**: increased frequency of occurrence, semantic change or drift,** and **phonological reduction**. The results reveal that squint indeed became grammaticalized across the age groups along all three dimensions:

a) **Frequency** – squint occurs twice as often in the relevant contexts in the responses of the younger two age groups (80 %) compared to the older group (39%).

b) The **meaning change** of squint was deduced from its distribution in the responses. In the younger and middle-aged signers, squint co-occurs with the whole relative clause and ist head in 90% of occurrences, as in (1). Here it serves as a grammatical marker of the relative clause (RC). In contrast, only 52% of the older signers' squint tokens are co-temporal with RCs. In the remaining cases squint fulfills the purely pragmatic function of building a common ground with the addressee, marking the referents that are not automatically accessible, as in (2).

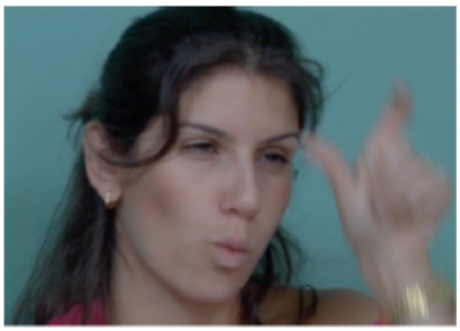
c) **Phonological reduction** – the intensities of the squints produced by the older and middle-aged groups are consistently higher (Intensities 2 and 3) than those produced by the youngest group (Intensities 1 and 2), as illustrated in Figure 1. Thus, the differences in the behavior of squint across the age groups are consistent with the defining criteria for grammaticalization. These findings in a sign language demonstrate empirically that intonation can undergo grammaticalization, and this may well have been the case for spoken language as well.

Examples:

(1) _____sq
[BOY RIDE-BICYCLE] [HOLD-KITE]
'The boy who is riding a bicycle, is holding a balloon'

(2) ____sq _____sq
[GIRL THIS] [RIDE WITH HORSE RIDE] [DRINK DRINK-WITH-STRAW DRINK]

'The girl who is riding a horse, is drinking with a straw.'



a) young signer:
squint-intensity 1

b) middle-aged signer:
squint-intensity 3

Figure 1. Reduction of squint intensity across generations of ISL signers

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Between non-manual gesture and grammar: Is headshake a negation marker in Polish Sign Language (PJM) and Australian Sign Language (Auslan)?

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This paper focuses on the obligatoriness of headshake as a negation marker in Polish Sign Language (*polski język migowy*, hereafter PJM) and Australian Sign Language (Auslan). We base our analysis on data extracted from extensive corpora of PJM and Auslan. PJM has not been discussed by Zeshan (2006) in her typology dividing sign languages into two groups: manual dominant languages (those that convey negation lexically) and non-manual dominant languages (those that primarily use non-manual markers to express negation), but Auslan was. However, it is not clear from Zeshan (2004 or 2006) into which category she would place Auslan. One of our aims is to discuss PJM and Auslan data in light of that typology. For the purposes of the present study we have analyzed, in the case of PJM, a sample of corpus data coming from 5 different signers performing 26 different elicitation tasks, and, in the case of Auslan, 98 different represented in 460 separate video clips from a variety of text types. The process of tagging both the PJM and Auslan corpora is still in progress, so the amount of data that will have been analyzed before the conference will be more extensive than we refer to here. The following tags in the PJM dataset have been used so far: *hsh_NEG* (for headshakes expressing negation); *hsh_ALT* (for headshakes expressing an alternative); *hsh_CL* (for headshakes used in classifier constructions); *hsh_Q* (for headshakes used in questions); *hsh_OTH* (for headshakes with other functions). Additionally, situations in which a negative manual sign is not accompanied by a headshake have marked as *hsh_O*. Every token marked with one of the tags mentioned above has also been assigned a part-of-speech (PoS) tag. The analyzed sample from the PJM corpus consisted of 62,268 tokens (of which 2,007 were assigned one of the above mentioned tags). In the PMJ data, tags marking negation occurred in 48.6% of cases. The *hsh_O* tag (marking the lack of headshake with negative manual signs) was used with 21.1% of the tagged tokens. Remaining types of headshakes, taken together, comprised 30.3% of all occurrences. Our main focus here is on the negative headshakes and their distribution on signs with different PoS tags. 8.9% of all negative headshakes were co-articulated with of positive meaning (as sole negators). 14.5% occurred with palm-ups. 33.8% of all negative headshake were co-articulated with morphologically negated signs. 17.6% occurred with different manual lexemes meaning ‘no’. Most importantly, our findings show that out of all analyzed morphologically negated signs, 49.7% were articulated together with a negative headshake and 50.3% without it. When it comes to ‘no’ lexemes, 72.2% were accompanied by a headshake and 27.8% lacked it. These results suggest that the headshake has not been grammaticalized in PJM as a mandatory negation marker. The Auslan corpus consists of more than 105,000 tokens (with to date at least 1,767 potential candidates identified for analysis with respect to negation and headshake). A preliminary analysis of a random 10% sample of the Auslan tokens suggests there is also no exclusive use or non-use of headshakes. Indeed, to date it looks at chance level: 50% of all morphologically negative manual lexical signs do not display headshake, and 50% of all negator signs or particles do not show headshake. We anticipate that these ratios will be maintained afterthe entire set is coded, analyzed for this presentation. The above findings, even if preliminary, do not support the interpretation of PJM or Auslan as non-manual dominant languages. More importantly, neither do they let us analyze PJM as a manual dominant language (due to the 8.9% of headshakes alone negating positive verbs). Sole headshake negation in Auslan has yet to be coded but will be completed in time to be presented along with the PJM data. Initial impressions are they will be numerous enough to reach a similar conclusion:

namely, for the time being we are not able to classify PJM or Auslan according to the Zeshan dichotomy.

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Mouth gestures as ideophones in American Sign Language

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Some mouth gestures (MGs) of American Sign Language (ASL) have been treated as adverbs (Liddell 1980), adverbials (Baker-Shenk and Cokely 1980), onomatopoeia (Bridges 2007) or as gestures (Sandler 2007). International sign language research on mouth gestures reveals a number of patterns with regard to form, meaning and grammar or usage. Some of these patterns include: iconicity; the correspondence of mouth movements with hand and finger movements; gradient changes in production; reliance on context for meaning; and cross-linguistic similarity with regard to form, meaning and function. For decades the linguistic study of ASL had been forced to emphasize a feature of language known as arbitrariness in order to illustrate that a sign language was fundamentally the same as spoken language. A more contemporary perspective on language now makes room for certain iconically motivated forms under what is word-like. At the heart of this discussion is the separation of communicative behaviors (of mouth and/or voice) which convey meaning by more depictive modes from those that convey meaning by symbolic modes. Ideophones lie at the interface of prototypical language forms which are arbitrary denotational symbolic units and the prototypical gesture or paralinguistic forms which are iconically motivated context-dependent expressive units. I propose that six MGs of American Sign Language: ‘aa’, ‘oo’, ‘puff’, ‘bp’. ‘puu’ and ‘bt’ belong to the word class known as ideophones as mentioned in Ajello, Mazzoni and Nicolai (2001). I support this argument by showing that these MGs share several hallmark features with spoken language ideophones, namely, a high degree of iconicity, low level of conventionalization, intractability of definition, high degree of context dependance, and their prominent use in storytelling as a means of creating a shared emotional and sensory experience. These patterns, taken as a whole, suggest that many mouth gestures behave as ideophones.

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FinSL head movements at the interface between gesture and language

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This paper compares the gestural and linguistic nature of head movements in Finnish Sign Language (FinSL). Movements and positions of the head have been said to perform a variety of functions at varying levels of syntax, prosody, grammar, and communication in different sign languages. Head movements such as nods and tilts have been associated with syntactic and/or prosodic boundaries and domains (Wilbur 2000; Nespor & Sandler 1999). On the other hand, different side-to-side or forward–backward movements of the head and/or of the torso have been said to occur when marking prosodic or contrastive stress (Wilbur & Patschke 1998; van der Kooij et al. 2006; Crasborn et al. 2013). In addition, different head movements have been found to produce distinctions between sentence functions such as assertion (e.g. nod), affirmation (e.g. nod, nodding), negation (e.g. head turn, headshake), and interrogatives (e.g. head thrust, head pull, sideways tilt of the head; see Liddell 1980; Wilbur 2000; Zeshan 2006). The linguistic status of such articulations, as well as of other nonmanual cues, has been explained by features in their scope and timing. It has been argued, for example, that linguistic nonmanuals have clear and abrupt onsets and offsets, and that they are clearly coordinated with syntactic units, whereas affective nonmanuals are more gradual and less systematic in their timing (e.g. Baker-Shenk 1983; Wilbur 2000).

However, according to a recent study on FinSL head movements (Puupponen et al. 2015), forms of head movement types such as nods or head thrusts are gradient, as are the relationships between the forms and functions of different head movements. Head movements of a certain type include a large amount of variation: a single head movement may be a hybrid of two head movements or in other ways formally on the border between two head movement types. Concerning the functions of head movements, a head movement of a certain type may perform several functions depending on the context (e.g. head thrusts marking contrast or interrogatives). In addition, a single head movement may have several overlapping functions (e.g. affirmative boundary-marking nod). Finally, formally different head movements may perform the same function in different contexts (e.g. nods and thrusts producing contrast between elements on a list). However, although the forms and functions of head movements vary depending on the context, the results of the study also show that regularities can be found in the form–function relationships of head movements in FinSL.

Puupponen et al. (2015) show that classifying nonmanuals as either affective or linguistic according to their scope and timing is not directly applicable for head movements in FinSL. The prosodic, syntactic, and communicative head movements do not differ significantly in their form or timing, nor is one used more systematically than the other. In my presentation, I discuss the noncategorical and unconventional nature of head movements (see Okrent 2002), and the implications that this has for the classification of head movements at the interface between language and gesture. I suggest that different head movements in FinSL are integral elements of the language system and that these movements differ in their level of conventionality, iconicity, and idiosyncrasy. According to these features, the movements may then be situated along a gestural–linguistic continuum.

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Mouth gestures in Serbian Sign Language

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The presentation is supposed to lay out the main findings of the first exploratory study on mouth patterns in Serbian Sign Language (SZJ). The study is set to verify certain claims made for other sign languages.

The topics of interest of the study are: 1) the frequency of SZJ signs which co-occur with a mouthing, mouth gesture or not any "distinguishable" mouth pattern; 2) the application to SZJ of the four categories of mouth gestures proposed by Crasborn et al. (2008) as contrasted with Sandler's (2003) view of a continuum between gestural-iconic mouth gestures and conventionalized, non-iconic mouth gestures; 3) the classification of SZJ mouth gestures based on the model by Crasborn et al. (2008); and 4) the problems encountered with the application to the SZJ data of the Crasborn et al.'s classification.

Since there is no corpus of SZJ, data had to be collected specifically for this study. The dataset consists of twenty narratives retold by 10 Deaf (near-)native signers of SZJ. The narratives were imported into ELAN and transcribed in relevant tiers (the latter is ongoing). A partial analysis of the data confirmed that mouthings are more frequent than mouth gestures, which tend to co-occur with more morphologically complex signs such as classifier constructions. Mouth gestures from SZJ can indeed be divided into the four categories based on the Crasborn et al. model: semantically empty mouth gestures, as in UVREDITI-SE (GET-OFFENDED) when lips release a /pə/ sound; adjectival and adverbial markers such as 'th' in LIVING-BEING-FALLS-TO-THE-GROUND carrying the meaning of lack of control; enacting mouth gestures such as 'drink through a straw'; mouth gestures in the context of whole face activity such as 'aa' used to indicate surprise. Even though it is possible to divide SZJ mouth gestures into the four categories proposed by Crasborn et al., as it has been shown in studies of other European sign languages, e.g. ISL (Mohr 2011, 2014), the classification in the case of the SZJ data has not been as straightforward as might be expected. Demey (personal communication, September 2014) suggests that it seems the problem at times arises from the lack of distinction between function/meaning (lexically bound, adverbial/adjectival, mimicking mouth) and form (mouth only, part of whole face activity). Furthermore, the equation between iconic and non-conventionalized is going to be questioned, particularly in the case of adverbial/adjectival mouth gestures.

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Nonmanual downtoning in German co-speech gesture and in German Sign Language

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The term 'downtoning' refers to the phenomenon of adding a particular (inter)subjective nuance to an utterance, indicating for instance the speaker's take on the content of the utterance, on how it relates to the context, or on how the interlocutor is expected to react. German is known to have a relatively rich inventory of particles used for downtoning purposes (the so-called 'downtoning particles' or 'modal particles' – in German 'Abtönungspartikeln' or 'Modalpartikeln'). In example (1) (a slightly shortened version of an example from Thurmair 1989:111), for instance, the speaker uses *denn* to indicate that the reason for asking the question is some element of the speech situation which is unexpected to him (in this case the agitation of the hearer), whereas *doch* indicates that the behavior (the agitation) of the interlocutor is to some extent irreconcilable with something he should already know (in this case the fact that the speaker is just doing his duty).

(1) Was regen Sie sich *denn* so auf? Ich tue *doch* nur meine Pflicht!
'Why are you *denn* so enraged? I am *doch* just doing my duty!'

However, these downtoning particles are not the only elements in German that can be used for downtoning purposes. Indeed, Schoonjans (2014) has shown that such downtoning meanings can also be expressed non-verbally, for instance by means of co-speech gestures. These gestures can be both manual (e.g. so-called 'interpersonal pointing') and non-manual (e.g. particular uses of the head nod, the headshake and the shoulder shrug). Interestingly, similar patterns have been described with related functions for German Sign Language by Herrmann (2013). This is not surprising given the observation that (especially pragmatic) markers in sign languages have often developed from gestures as they are also used in spoken languages (e.g. Pfau & Steinbach 2006, Wilcox 2007).
This talk presents the first results of a more systematic comparison of these downtoning patterns in German co-speech gesture and German Sign Language. In line with the central topic of the workshop, the focus is on the non-manuals. The discussion goes beyond the question to what extent corresponding forms are used with corresponding functions, however. Indeed, other formal properties are taken into account as well, for instance the idea that the duration of these pragmatic markers is an indication of their scope (they overlap with the words/signs they have scope over), an idea which has been put forward for both co-speech gesture and sign (apart from Herrmann's and Schoonjans's work e.g. Harrison 2010 and Zeshan 2004). Another question to be raised is whether the presence or absence of a so-called 'lexical affiliate' (a word/sign with a corresponding or at least closely related meaning) makes a difference for the non-manual marking of downtoning. Indeed, the downtoning gestures in German typically have such lexical affiliates (under the form of the aforementioned modal particles) and can be used both individually and in combination with this affiliate, while for German Sign Languages, no such lexical affiliates under the form of conventionalized manual signs have been described to date. The question then is whether the presence or absence of a lexical affiliate in spoken German makes a difference to the use of the gesture, e.g. with regard to when it occurs, and if so, whether the situation in German Sign Language is more like what we find when there is no lexical affiliate in spoken language either.

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