SIGN ✋ HUB

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D4.4 First SIGN-HUB Conference

Version 1.0 – 30/09/2016

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Work package: WP3

Nature of deliverable[1]	R	DEM	DEC	O
Dissemination level[2]	PU	PP	RE	CO

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[1] R: Report, DEM: Demonstrator, pilot, prototype, DEC: Websites, patent fillings, videos, etc., O: Other

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1. Scope of the document

This document presents general data about the first SIGN-HUB Conference and the dissemination material.

2. Introduction

The first SIGN-HUB conference took place at the University of Venice on September 1-2, 2016. It was the fifth edition of the "Formal and Experimental Advances in Sign language Theory" (FEAST) colloquium.

The dissemination of the conference was done through linguist lists (e.g. SLLing-List) and the conference website (see Figure 1). 90 people attended the event.

Figure 1. SIGN-HUB Conference website.

https://sites.google.com/site/feastconference/home/conferences/feast-venice-2016
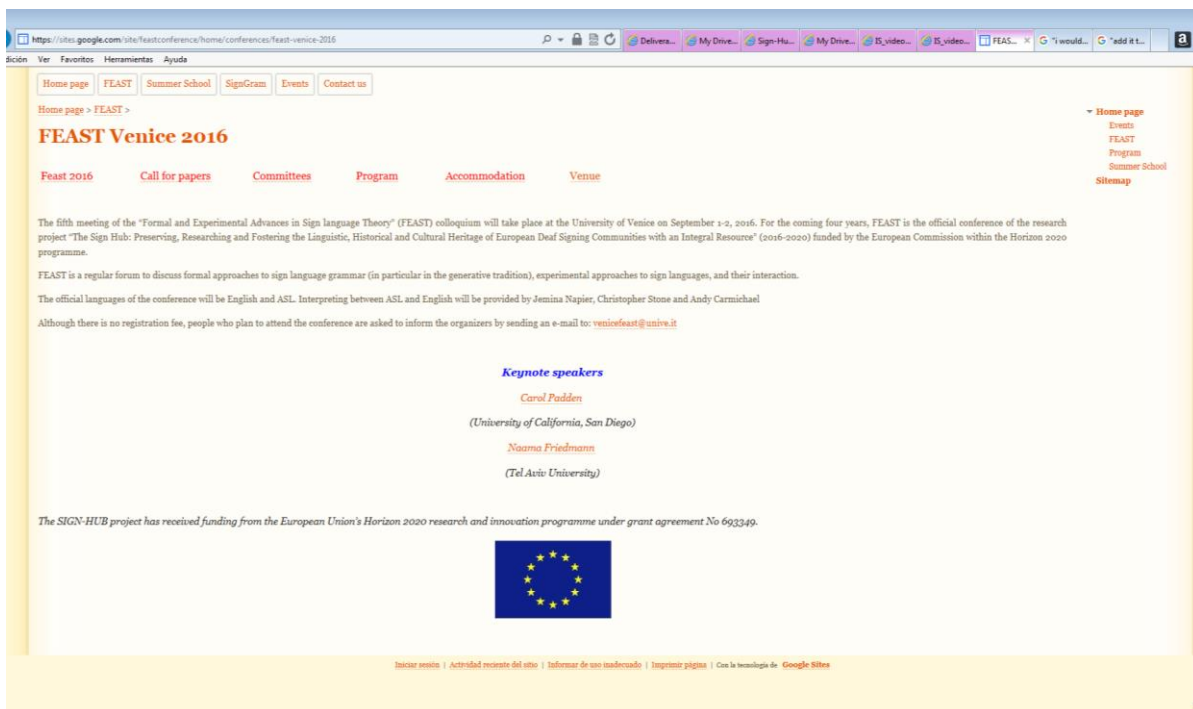
3. Leaflet

Poster sessions:

September 1ˢᵗ, 2016

Classifications of modal-like expressions in Japanese Sign Language: a preliminary study to investigate the cartography of the right periphery
Kazumi Matsuoka (Keio University)

Discourse functions of palm-up in German Sign Language (DGS)
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September 2ⁿᵈ, 2016

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Scientific Committee:
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Carlo Geraci
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Gaurav Mathur
Roland Pfau
Christian Rathmann
Josep Quer
Markus Steinbach
Ronnie Wilbur
Bencie Woll

Organizing Committee:
Chiara Branchini
Anna Cardinaletti
Carlo Cecchetto
Josep Quer

The official languages of the conference will be English and ASL. ASL/English interpreting will be provided.

For information:
venicefeast@unive.it

Università Ca'Foscari Venezia

Dipartimento di Studi Linguistici e Culturali Comparati

Venice Feast Colloquium, Formal and Experimental Advances in Sign language Theory (FEAST)

September 1-2, 2016

Auditorium Santa Margherita
Campo Santa Margherita – Venezia

September 1st, 2016

8:15 Registration

8:45 Welcome and opening

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Carol Padden - invited speaker (University of California, San Diego)

9:50 *Psych-verb constructions in Sign Language of the Netherlands (NGT)*
Marloes Oomen (University of Amsterdam)

10:30 *Is it going backwards? Not really!*
Carlo Geraci (CNRS, Institut Jean Nicod, Paris), **Lara Mantovan** (Ca' Foscari University Venice), **Valentina Aristodemo** (CNRS, Institut Jean Nicod, Paris)

11:10 Coffee break

11:40 *How to lick a plate clean in DGS: Resultative constructions in German Sign Language*
Cornelia Loos (University of Texas at Austin)

12:20 *Transitivizing strategies for motion predicates in 3 Sign Languages*
Elena Benedicto (Purdue University)

13:00 Lunch break

14:20 *The effect of a classifier predicate on the word order in an SVO sign language*
Matic Pavlič (Slovenian Academy of Sciences and Arts)

15:00 *Word-internal coordination in handling classifier predicates*
Vadim Kimmelman, **Roland Pfau**, **Enoch Aboh** (University of Amsterdam)

15:40 Poster presentation

16:10 Coffee break

16:40 Poster session

17:20 *Factors favouring instrument promotion in sign language predicates*
Diane Brentari, **Emre Hakgüder**, **Kat Montemurro** (University of Chicago)

18:00 *Representation of Event Semantics in Predicate Signs and Gestures*
Natasha Abner, **Ryan King**, **Marta Russonniello** (Montclair State University)

18:40 Business meeting

20:00 Social dinner

September 2nd, 2016

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Helen Koulidobrova (Central Connecticut State University)

9:40 *When one patterns someone: Defining the properties of two indefinite pronouns in Catalan Sign Language (LSC)*
Gemma Barberà (Universitat Pompeu Fabra), **Patricia Cabredo Hofherr** (CNRS, Paris 8)

10:20 *Adjunct subordinate: the case of temporal clauses in LIS*
Valentina Aristodemo, **Carlo Geraci**, **Mirko Santoro** (CNRS, Institut Jean Nicod, Paris)

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17:00 *Pointing to the right side: An ERP study on anaphora resolution in German Sign Language*
Anne Wienholz, **Derya Nuhbalaoglu**, **Annika Herrmann**, **Edgar Onea**, **Markus Steinbach**, **Nivedita Mani** (University of Göttingen)

17:40 *Syntactic difficulties in the spoken language of orally-trained individuals with hearing-impairment*
Naama Friedmann - invited speaker (Tel Aviv University)

18:30 Closing session

4. Poster

Università Ca'Foscari Venezia

Dipartimento di Studi Linguistici e Culturali Comparati

Supported by:
H2020 project SIGN-HUB
(693349)
Dipartimento di Studi Linguistici e Comparati
(Università Ca' Foscari Venezia)

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6. Abstracts book

Dipartimento di Studi Linguistici e Culturali Comparati
Università Ca' Foscari Venezia

VENICE FEAST COLLOQUIUM

FORMAL AND EXPERIMENTAL ADVANCES

IN SIGN LANGUAGE THEORY

September 1-2, 2016
Auditorium Santa Margherita, Campo Santa Margherita, Venezia

ABSTRACT BOOK

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with hearing-impairment
Naama Friedman - invited speaker (Tel Aviv University)

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Second poster session (September, 2)

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Jóhannes Gísli Jónsson, Rannveig Sverrisdóttir (University of Iceland), Júlía G. Hreinsdóttir, Kristín Lena Þorvaldsdóttir (The Centre for the Deaf and Hard of Hearing, Reykjavík)

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ABSTRACTS

ORAL PRESENTATIONS

ICONICITY AND MORPHOLOGY

Carol Padden (University of California San Diego)

Our work on the phenomenon of patterned iconicity (Padden et al., 2013; Padden et al., 2014) has led us to form a different perspective on sign language morphology. In patterned iconicity, lexical signs can share one or more iconic strategies, forming a pattern indicating a semantic category. One of the most robust and unusual is the handling/instrument pattern, most frequently found in signs for hand-held tools. It is unusual because it is not absolute (one strategy per word category), but it alternates in which one or the other strategy can vary systematically in a sign language. The strategies of showing how objects are held during a characteristic action (handling), or showing the shape and dimension of an object also during a characteristic action (instrument) are also used in signs for fruits and vegetables, and in signs for animals. Based on a survey of lexical signs in 8 different unrelated sign languages (Hwang et al., submitted), we find that the handling/instrument strategies appear less frequently in the latter 2 categories than the first. Key to the concept of patterned iconicity is the observation that signs within a pattern can vary in handshape, location and movement; what they have in common is that they share one or more strategies. Our work on this pattern, and a number of others, suggest a different view of word structure in sign languages (Lepic, 2015). Using examples from non-signing gesturers, Al-Sayyid Bedouin and ASL signers, we show two different views of morphology: 1) signs are formed from roots or morphemes, and 2) whole signs share common patterns, and new signs are formed following existing patterns. The first characterizes sign forms as compositional, and the second, as exhibiting word-level regularities shared across signs of similar semantic categories. This alternative view has implications for describing the relationship between iconicity and morphology, particularly how we account for classifier structures, and how we characterize the gesture-sign continuum (Kendon, 2000).

PSYCH-VERB CONSTRUCTIONS IN SIGN LANGUAGE OF THE NETHERLANDS (NGT)

Marloes Oomen (University of Amsterdam)

Background and goals. Psych-verbs, which denote a psychological state, have been shown to constitute a class of their own both semantically and syntactically (see e.g. Belletti & Rizzi 1988, Pesetsky 1995, Landau 2010). This study contributes to our understanding of the particularities of this verb type by investigating psych-verb constructions in a sign language (SL), namely SL of the Netherlands (NGT). An analysis of naturalistic corpus data shows that psych-verbs iconically encode a locative relation between a psychological state and a metaphoric location. I argue that this relation should be represented structurally as a locative adjunct. The syntactic consequences of this approach are discussed.

Methodology. 309 fully glossed video clips from the Corpus NGT (Crasborn et al. 2008) were analyzed. In the clips, 72 signers engage in dialogue and recount stories and fables. Psych-verbs were identified with a manual search of 30 video clips, followed by an automatic search of the entire data set using search terms. Examples were further annotated for manual signs and relevant non-manual markers (e.g. role shift) in a separate data file.

Results. There are three main findings. First, most (95%) psych-verb forms refer to either the metaphoric location of an emotion (LOVE (1a)), or an involuntary type of behavior associated with an emotion (NERVOUS (1b)). They are body-anchored (1a), or the hands represent the hands or legs (1b). Second, LOVE, HATE, and MISS select an Experiencer and a Theme, while the other 13 psych-verbs identified usually select only an Experiencer (85%). The Experiencer appears to be the subject, given its typical sentence-initial position (2a) and the fact that, in examples with AUX-OP, the auxiliary starts at the locus of the Experiencer (2b) (cf. Bos 1994). Third, Experiencers may be non-overt, but typically only when its referent is first person, or if it is third person but the psych-verb is marked by role shift (3).

(1)
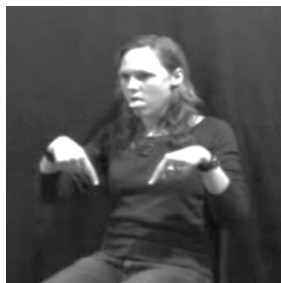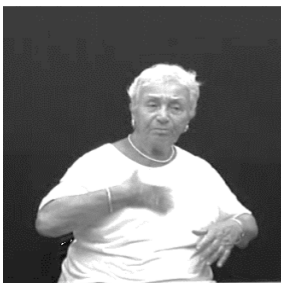
(2) a. INDEX$_1$ MISS SURROUNDINGS

‘I miss the surroundings.’

b. INDEX$_1$ ANGRY $_1$AUX-OP$_3$ GROUP$_3$

‘I was angry with the group.’

$\overline{\hspace{3cm}}$ rs

(3) NERVOUS AFRAID

‘He was nervous and afraid.’

Theoretical account. Meir et al. (2007) argue for SLs that in body-anchored verbs, the body represents the subject as part of the verb's lexical structure. The highest-ranking thematic role maps

onto this subject. Thus, for psych-verbs, the body is argued to represent a subject Experiencer. Based on spoken language data, Landau (2010) argues that Experiencers in psych-constructions are mental locations, realized as locative arguments. Integrating insights from both accounts, we might propose that the body represents an Experiencer, i.e. a mental location linguistically realized as a locative. However, this would predict that examples like (2ab) include two Experiencers; one represented overtly and one by the body.

(4)

```
                    IP
                  /    \
               DPᵢ       I'
               /\      /    \
          INDEX₃      I        vP
             ▲        |       /   \
             |     (AUX-OP)  t      v'
             |        |      |     /   \
             |_____|           V      VP
                                  |     /    \
                                Oppsp  PP       VP
                                      /  \     /   \
                                     P    DP  V     DP
                                     |   / \  |    (Theme)
                              PoA[AFRAID] Dᵢ NP AFRAID
                                        |   /\
                                 [signer's  chest
                                   body]
```
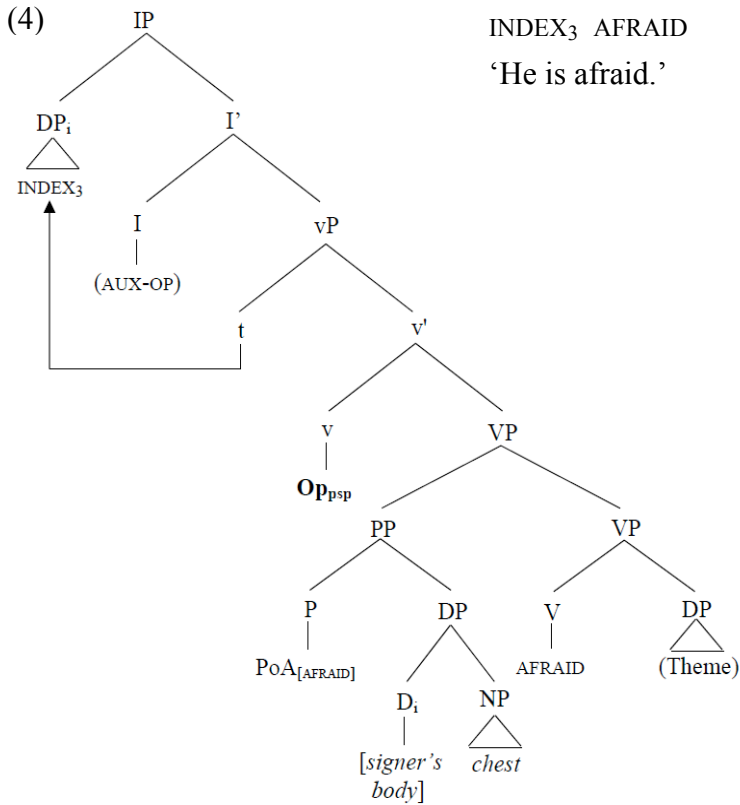
INDEX₃ AFRAID
'He is afraid.'

In an alternative proposal, I argue that three iconically motivated components of a psych-verb form make up a locative adjunct that adjoins to the VP (4). The adjunct may be paraphrased as 'in the signer's body's [mental location]'. The place of articulation of the verb on the body expresses a locative relation and functions like a preposition. It singles out a mental location, i.e. a specific location on the body such as the chest or head. The signer's body as a whole contains the mental location and as such functions like a possessive determiner, co-indexed with an overt Experiencer (4).

I furthermore argue that the articulation of a psych-verb triggers an inherent shift in perspective, not marked overtly, such that the signer represents the perspective of the Experiencer, regardless of who the referent is. Similar to what has been proposed for constructions with role shift (Lillo-Martin 1995; Quer 2005, 2011), the shift is introduced by means of an operator, which takes everything that falls within its c-command domain in its scope (4). The operator is typically non-overt, although it may be realized as the verb LOOK (5), which is also attested in American SL psych-constructions (Winston 2013). The operator ensures that, when an overt Experiencer is not first person, there is no 'mismatch' between the Experiencer and the signer's body functioning as a possessive determiner. It also offers an explanation as to why only first person Experiencers may be non-overt: in these cases, the signer is the Experiencer by default, given that the signer's body is the only indicator of the Experiencer's referent in the clause. In case of a non-overt third person referent, role shift functions to explicitly indicate that a shift has occurred by overtly signaling that not the signer but another referent is the Experiencer. Finally, if present, AUX-OP is merged in the head of the IP, triggering movement of the Experiencer (ignoring for now the position of the psych-verb relative to the auxiliary in (2b)). The Theme is merged in the complement of the VP.

rs
                                     _____
(5) INDEX$_1$ $_1$LOOK$_3$ SURPRISED

   'I looked at him, I was surprised.'

Conclusions. I have argued that the iconic components of psych-verbs should be represented as a locative adjunct, thus aligning myself with recent efforts to formally account for iconic properties in SLs (e.g. Schlenker 2014; Schlenker et al. 2013). Conversely, constructions with psych-verbs that are not iconically motivated do not include such an adjunct, which fits with the notion that adjuncts are by definition optional. The account is expected to hold for iconically motivated psych-verbs and potentially other types of body-anchored verbs in SLs other than NGT as well.

Selected references.

Belletti, A. & L. Rizzi. 1988. Psych-verbs and θ-theory. *Natural Language and Linguistic Theory* 6. 291-352.

Landau, I. 2010. *The locative syntax of experiencers*. Cambridge, MA: MIT Press.

Meir, I, C. Padden, M. Aronoff & W. Sandler. 2007. Body as subject. *Journal of Linguistics* 43. 531-563.

Quer, J. 2011. Reporting and quoting in signed discourse. In E. Brendel, J. Meibauer & M. Steinbach (eds.), *Understanding quotation*, 277-302. Berlin: Mouton de Gruyter.

Schlenker, P., J. Lamberton & M. Santoro. 2013. Iconic variables. *Linguistic Philosophy* 36. 91-149. Winston, C. 2013. *Psychological verb constructions in American Sign Language*. West Lafayette, IN: Purdue University MA dissertation.

IS IT GOING BACKWARDS? NOT REALLY!

Carlo Geraci[*], Lara Mantovan[+], Valentina Aristodemo[*]

([*]CNRS, IJN, Paris & [+]Ca' Foscari University, Venice)

The puzzle. The analysis of directionality as agreement (i.e. sensitivity to number, Lillo-Martin & Meier 2011) leaves open the issue of backwards verbs. The example in (1) from Italian sign language (LIS) shows that this subclass of verbs exhibits an inverse pattern with respect to the usual subject → object directionality, apparently marking object → subject directionality.

(1)   IX-3 PICTURE COPY$_{\text{PICTURE} \rightarrow \text{IX-3}}$ 'He copied the picture.'

Beside showing an idiosyncratic directionality, backwards verbs are problematic in that they violate two principles of language organization: i) the Mirror Principle (Baker 1985) because they display a mismatch between the syntactic hierarchy and the order of agreement morphemes; and ii) the Uniformity of Theta Assignment Hypothesis (UTAH, Baker 1988) because they display a mismatch between the hierarchy of theta roles and the direction of agreement.

Goals. i) To show that at least some backwards verbs have a forward directional pattern, despite prima facie visual appearance; ii) To prove that backwards verbs do not violate either the Mirror Principle, or iii) the UTAH (or other similar thematic hierarchies).

Data. Data are from two LIS native signers. We excluded verbs like TAKE, because they include a forward grasping movement before going backward and for this reason they do not "genuinely" count as backwards. We focused on those verbs in which the phonological movement does not start from the location of the subject/agent. Specifically, we tested verbs like CHOOSE, INVITE, and COPY, cf. (1).

Backwards verbs do not agree with the subject/agent. To show this we use agent-oriented adverbs and handling classifiers (not shown here) (Benedicto and Brentari 2004).

(2)   a. */# TEXT COPY ON-PURPOSE   Intended: 'pro$_{\text{Gianni}}$ copied the text on purpose.'

         b. TEXT COPY   'The text was copied.'

         c. GIANNI TEXT COPY ON-PURPOSE   'Gianni copied the text on purpose.'

(3)   a. MARIA KILL (ON-PURPOSE)   'pro$_{\text{Gianni}}$ killed Maria (on purpose).'

         b. GIANNI MARIA KILL ON-PURPOSE   'pro$_{\text{Gianni}}$ killed Maria on purpose.'

Backwards verbs with overt subject/agent are compatible with agent-oriented adverbs (cf. 2c vs. 3b), while they are unacceptable with null subjects (cf. 2a vs. 3a). Still a "middle" reading is accessible when no agent-oriented adverb is present (cf. 2a vs. 2b). This shows that: i) the final *locus* of agreement in backwards verbs is not that of the subject/agent; ii) the agent of backwards verbs is optionally encoded in the syntax.

Backwards verbs agree with two internal arguments. To show this we use sensitivity to plural marking

(Benedicto and Brentari 2004, Lillo-Martin and Meier 2011) and compatibility with resultative clauses (not shown here) (Bresnan and Zaenen 1990).

(4)   a. VALENTINA IX-3 TEXT IX-LOC COPY$_{A \to TEXT}$ COPY$_{B \to TEXT}$ COPY$_{C \to TEXT}$

'Valentina copied the text from multiple sources.'

b. VALENTINA IX-3 TEXT$_A$ TEXT$_B$ TEXT$_C$ ALL COPY$_{SOURCE \to A}$ COPY$_{SOURCE \to B}$ COPY$_{SOURCE \to C}$

'Valentina copied all the texts from a single source.'

Both starting and end *loci* can inflect for plural person, which is a marker of object (i.e. internal argument) agreement. This shows that the agreement pattern in backwards verbs is between two internal arguments.

The optional external argument determines directionality in functional markers. To show this we use imperative constructions.

(5)   a. MARIA KILL$_{IX2 \to MARIA}$ PU$_{(2) \to MARIA}$ 'Kill Maria!'

b. MARIA KILL$_{IX2 \to MARIA}$ MOVIMP$_{2 \to MARIA}$ 'Go and kill that text!'

(6)   a. TEXT$_{GOAL}$ COPY$_{SOURCE \to GOAL}$ PU$_{(2) \to SOURCE/*GOAL}$ 'Copy that text!'

b. TEXT$_{GOAL}$ COPY$_{SOURCE \to GOAL}$ MOVIMP$_{2 \to SOURCE/*GOAL}$ 'Go and copy that text!'

Two functional signs encode imperatives in LIS: PALM-UP and MOVIMP (Donati et al. in press.). Both may display agreement between the subject/agent and the object in forward verbs (cf. 5). Crucially, with backwards verbs, agreement is between the second person and the source (never with the goal), cf. (6).

Analysis. We explain the contrast in (2-3) by analyzing backwards verbs as unaccusative/middle/pseudopassive constructions. In these constructions, the external argument is missing and one of the internal arguments is promoted to subject position. The fact that directionality is shown is because the verbs are di-transitive, as in the English examples in (7) where either internal argument can be promoted to subject position.

(7)   a. A book was given to Mary

b. Mary was given a book

Under this analysis, the surface subject of backwards verbs is the source argument. The agreement pattern exhibited by these verbs is then between the two objects which bear source and goal theta roles (see also Meir 1998). Since the surface subject is an underlying object, sensitivity to plural person agreement for both *loci* as shown in (4) is also accounted for.

As for the Mirror Principle and the UTAH, backwards verbs are not mysterious anymore since neither is actually violated. This is so because i) the order of *loci* morphemes on the verb matches the hierarchical structure (the higher morpheme is spelt out first) and ii) the theta role hierarchy matches the syntactic hierarchy (higher theta roles are mapped onto higher syntactic positions).

To account for the pattern in (5), we assume that the agent is "late merged" in the syntactic derivation. The projection in which it is merged is the one that normally hosts imperative subjects (i.e. prototypical agents). This projection is higher than the standard AgrP, where subjects of

forward verbs move. A similar proposal has been made for some constructions in ergative languages (Laka 2016). This fact explains why the agent of imperative backwards constructions does not interfere in the agreement pattern of backwards verbs (cf. 6). (with imperative non-backwards constructions the subject/agent raises to the relevant projection from spec, AgrP).

Notice that the Mirror Principle and the UTAH are respected even in imperative constructions. Once introduced in the syntax, the agent of the imperative construction determines directionality of the imperative marker (hence the higher morpheme is spelt out first), and its position in the thematic hierarchy is by default higher than any other assigned at the VP level (hence higher thematic roles are mapped onto higher syntactic positions).

Finally, while late merge of agents needs to be stipulated in most minimalist frameworks (to account for LIS and Basque data), it is predicted by theories like telescopic syntax (Adger 2013).

Conclusion. (some) Backwards verbs are not exceptional after all because directionality still markes agreement between the surface subject and the object, and because no exceptionality of theta marking is required. The analysis developed here shows that these verbs are like middle constructions and supports theories where external arguments can be late merged in the syntax.

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HOW TO LICK A PLATE CLEAN IN DGS: RESULTATIVE CONSTRUCTIONS IN GERMAN SIGN LANGUAGE

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Background. A hallmark of human language is its ability to package information efficiently, for example by communicating complex events within a single sentence. However, we find considerable cross-linguistic variation in the domain of cause-result events: While languages like English express manner, cause, and result in a single clause, languages like Spanish need to use a subordinating structure or an adverbial construction. To date, few studies have investigated the linguistic expression of complex events in signed languages. Their focus rests mostly on complex motion events ([9], [8], [1]), with a small number of studies looking at the expression of causation ([2], [10]). Only [5] looks at concealed causatives and posits the existence of resultative constructions in ASL.

Aims. This paper looks at two constructions in DGS that express a causing event and its result state. In (1), the result predicate follows the causing predicate, but precedes it in (2). I present arguments for the monoclausal status of both constructions and propose to treat (1a) as a complex predicate and (1b) as a resultative construction.

(1)   a. WOMAN PLATE LICK CLEAN

'The woman licked the plate (until it was) clean.'

b. IX-$_{rt}$ FRIDGE EAT EMPTY

'He ate until the fridge was empty/ate the fridge empty.'

<u>   top</u>

(2)   a. PLATE, WOMAN CLEAN LICK

'The plate, the woman licked (until it was) clean.'

b. IX-$_{rt}$ FRIDGE EMPTY EAT

'He ate until the fridge was empty/ate the fridge empty.'

Study. The data for this study consist of elicited productions from three (near-)native signers of DGS. Each signer watched 16 non-verbal video sequences featuring an agent whose actions cause either himself or another participant to change state (e.g. a woman licking a plate clean). The signers described each sequence as concisely as possible and subsequently answered questions about possible permutations of their productions. The data were coded in ELAN, including sign-by-sign annotation and prosodic coding to support decisions about sentence boundaries.

Arguments. The main argument for treating the cause-result descriptions in (1) and (2) as monoclausal comes from word order. DGS is an SOV language [3], and the affected participant in (1) sits in canonical direct object position; there is no non-manual topic-marking on subject or

object that would suggest otherwise. Since FRIDGE in (1b) is not selected by the verb EAT, it must be contributed by the result predicate EMPTY. I propose that cause and result predicate undergo restructuring, yielding a single predicate-argument structure for (1). Further evidence for this analysis is provided by showing that no lexical material (e.g. no modal verbs) can intervene between cause and result predicates (a modal instead occurs pre-verbally or in final position, as in (3g)). The result-cause construction in (2) features the result predicate and its argument in object position. Since this center-embedded position cannot be occupied by full sentential complements in DGS [7], the result predicate does not project a full clause, thus patterning with canonical resultative constructions that contain at most a small clause (e.g. [4]).

For both constructions, I will provide further evidence for their monoclausal status: Syntactically, both constructions allow final pronouns that are co-referential with the causer subject (3a-c), which points to a higher degree of syntactic integration than coordination of cause and result clauses [7]. In the same vein, causer subjects can be extraposed via rightward *wh*-movement in both constructions (3d-f), suggesting that the utterances in question form part of the same CP. Semantically, a final modal verb in a cause-result construction takes scope over the causing predicate (3g). In contrast, my data show that final modals in hypotactic constructions only scope over the embedded predicate in DGS, suggesting that the result predicate in (3g) does not form a separate subordinate clause. A second piece of semantic evidence involves the causation implication. Canonical resultative constructions entail direct causation of the result state by the causing action, and we expect the same behavior for the constructions in (1) and (2).

(3)   a. KITTY IX-$_{rt}$, MIEZ IX-$_{lf}$, IX-$_{rt}$ LICK-$_{lf}$ CLEAN IX-$_{rt}$
        'Kitty$_i$ is over here (right), Miez$_j$ is over there (left), she$_i$ licks (her$_j$) clean, she$_i$ does.'
        b. IX-$_{rt}$ FRIDGE EAT+ EMPTY IX-$_{rt}$
        'He ate the fridge empty, he did.'
        c. CARPENTER IX-$_{lf}$ TABLE SASS:rectangle SMOOTH SAND+ IX-$_{lf}$
        'The carpenter sanded the table smooth, he did.'

                                                              _____wh_____
        d. PLATE CLEAN LICK WHO   e. FRIDGE EMPTY EAT+ WHO
        'Who licked the plate clean?'
        f. IX-$_{down}$ TABLE SAND+ SMOOTH WHO
        'Who sanded the table smooth?'
        g. CARPENTER IX-$_{rt}$ TABLE SAND-$_{table}$+ SMOOTH-$_{table}$ MUST
        'The carpenter has to sand the table smooth.'

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TRANSITIVIZING STRATEGIES FOR MOTION PREDICATES IN 3 SIGN LANGUAGES

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Goals. This work explores the syntactic mechanisms and strategies used in three sign languages to transitivize (that is, to add an agent argument) motion predicates. Given previous structural differences observed cross-linguistically (e.g., Hale and Keyser, 2001), we consider two types of predicates: those where there is continuous contact between the Agent and the Theme of the motion predicate (e.g., the *take*-type of *John took the child to the doctor*) and predicates where there is only initial non-continuous contact (e.g., the *kick*-type of *John kicked the ball into the goal*).

Data Collection. Data were collected from three sign languages (HKSL, LIS and ASL) with 4 participants for LIS, 3 for ASL and 1 for HKSL. These data are part of a larger project on Motion Predicates containing 175 animated video-clips, of which 87 are related to transitivization. The 87 items were divided into two groups: initial non-continuous contact (*kick*-type) with 50 items and continuous contact (*take*-type) with 37 items, exemplified below in (1)a-b. Each item has a corresponding minimally contrastive intransitive pair (1c for 1a-b).

(1) a. transitive: non-continuous contact   b. transitive: continuous contact

c. intransitive

Hypohesis. Based on previous work, we assume that the Agent argument is introduced by a subtype of v^o head (Kratzer 1996). Based on further work both on SL and in SpL (Borer 1994, 2005; Benedicto-Brentari 2004; Harvey 2013), we also assume that there may be a *v*-split with an agentive v_2 structurally separate above a thematic *v* (v_1), the former represented by a Handling or BodyPart classifier, the second one represented by a WholeEntity classifier. This *v*-split may be realized as a verb sequencing (SVC).

(2)
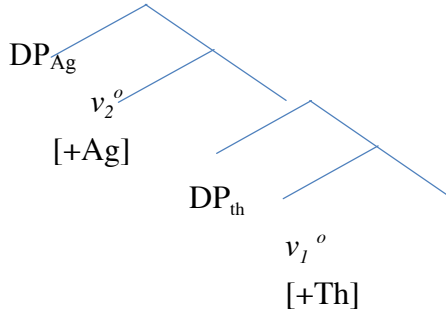
With this structure in mind, we expect to see different implementations of the v^o [+Ag] head for (1a) and for (1b) types.

Results and Analysis. Preliminary results do indeed show continuous and non-continuous predicates using different strategies.

For the **continuous contact** type, three distinct structural strategies are observed; examples below correspond to [0706] in (1b) above. The first one involves a *sandwich* type of verb sequencing:

(3) (FATHER$_{AGENT}$) (CHILD$_{THEME}$) 5-5$_{HDL}$=HOLD Y$_{WE}$-B=SLIDE-DOWN 5$_{HDL}$-B=HOLD(-SLIDE-
)DOWN   [0706-HKSL]

In this case, the first element in the verb sequencing (5-5=HOLD) involves a two-handed handling classifier (corresponding to the [+Ag] v^o), followed by a Y- whole entity classifier (corresponding to the theme v^o) articulated by H1 over the B-shaped H2 referencing the location, closing off again with 5- handling classifier on a B-shaped H2. The 5-Agent-related classifier *sandwiches* the Y theme-related classifier.

The second strategy corresponds to a 2-layer verb sequencing. In this case, the initial 2-handed 5-5 handling classifier is followed by a simultaneously co-articulated classifier where the H1 corresponds to the theme and the H2 to the agent:

(4) 5-5$_{HDL}$=HOLD Vbent$_{HDL}$-Vbent$_{WE}$=CARRY/SLIDE-DOWN   [0706-LIS]

Finally, the third strategy for continuous contact involves a simple handling classifier of the type described in Benedicto-Brentari 2004:

(5) 5-5$_{HDL}$=HOLD/SLIDE-DOWN   [0706-LIS]

For **non-continuous** (initial) contact ([0704] in (1a) above), on the other hand, a different kind of verb sequencing is used:

(6) (FATHER$_{AGENT}$) (CHILD$_{THEME}$) B$_{BP}$-Y$_{WE}$=PUSH Y$_{WE}$=SLIDE-DOWN   [0704-HKSL]

In these cases, a BodyPart classifier (B-) is linked to the [+Ag] v^o on the H2, whereas the H1 references the [theme]; the second part of the verb sequencing follows with a Y-shaped whole entity classifier articulated on the H1 linked to the [+Theme] v^o. This is consistent with previous analyses (by [Author]) identifying this hand-shift as a Swtich Reference mechanism.

Summarizing, then, continuous contact transitivizing strategies encompass the use of an initial handling classifier followed, optionally, by a verb sequencing involving a whole entity classifier associated with the theme argument. The non-continuous transitivizing strategy, on the other hand,

encompass a BodyPart classifier on H2, followed by a verb sequencing involving a whole entity classifier representing a hand-shift Switch Reference phenomenon absent in the the continuous contact counterpart. In both cases, however, the Agent argument is introduced by a v_2^o head represented by either a Handling or a BodyPart classifier, as expected from the structure in (2).

THE EFFECT OF A CLASSIFIER PREDICATE ON THE WORD ORDER IN AN SVO SIGN LANGUAGE

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Introduction. The effect of a classifier predicate on the word order in transitive sentences is a well known phenomenon in sign language (SL) linguistics, while Sze (2003) is the only author noticing it in ditransitive sentences. In this study, I examine the word order of transitive and ditransitive sentences with a classifier predicate and provide a part-of-the-speech analysis of this predicate in Slovenian Sign Language (SZJ).

Transitive word order. In SVO languages – such as Jordanian SL (Hendriks 2007), Colombian SL (Oviedo 2003) Russian SL (Kimmelman 2012), Flemish SL (Vermeerbergen 2004) and Hong Kong SL (Sze 2003) – classifier predicates tend yield a non-basic SOV word order. In SZJ, the sentence displays the basic SZJ word order, which is SVO, if a non-classifier citation form is chosen (1a).[1] In (1b), a classifier that denotes the type of entity that is being used (namely a glass) is incorporated. The predicate is now a classifier predicate and the sentence displays the non-basic SOV word order.

(1) a. CHILD   DRINK   MILK2   non-classifier predicate
        'A/the child drinks milk.'   (SZJ; n106)

      b. MOTHER   MILK   DRINK-CL(C)   classifier predicate
        'A/the mother drinks milk.'   (SZJ; 1.10.2)

Ditransitive word order. Supalla (1986), Emmorey (2003), Zwitserlood (2003), among others, show that classifier predicates are complex predicates and their complexity is assumed to trigger their non-basic sentential positions since heavy constituents tend to linearize as the rightmost constituents in the sentence. However, in SZJ ditransitives, the classifier predicate does not come as the last constituent in the clause: the use of a classifier verb GIVE-CL(C) in example (2b) yields a non-basic SO_dVO_i word order. This indicates that the explanation in terms of a "heavy predicate shift" cannot be maintained for this language.

(2) a. BOY   GIVE   BOOK   WOMAN   non-classifier predicate
        'A/the boy gives a/the book to a/the woman.'   (SZJ; j89)

      b.
        WOMAN $CL(P)_a$ THREE $BOOK_b$ $_bGIVE\text{-}CL(C)_c$ R:IX_c BOY   classifier predicate
                                                L: . . . .
        'A/the woman gives a/the pile of three books to a/the boy.'   (SZJ; m65)

Predicative head 'HAVE'. According to Zwitserlood (2003), classifier predicates consist of a predicative head (movement subcomponent) and a nominal head (classifier handshape). In SZJ,

---

[1] bs=body-shift; hs=head-shake; eb=eye-blink; a,b,c=referential locations; O_d=direct object; O_i=indirect object; S=subject; V=verb

predicative head may be produced overtly – as in examples where it is represented by the non-classifier verb HAVE (3a). In order to research the categorical status of a classifier predicate it is necessary to understand the function of the verb HAVE. Since it is produced optionally, I assume that it is not an auxiliary but a full verb.

(3) a.
$\overline{\qquad}^{\text{EB}}$ $\overline{\qquad}^{\text{BS}}$
WOMAN HAVE THREE BOOK AGAIN HOLD-CL(C)$_a$ non-classifier predicate
‘A/the woman once again holds three books.’   (SZJ; books7n)

 b.
$\overline{\qquad}^{\text{EB}}$ $\overline{\qquad}^{\text{BS}}$
WOMAN TWO BOOK$_b$ HOLD-CL(C)$_a$ classifier predicate
‘A/the woman holds two books.’   (SZJ; books7n)

Mono- or biclausal structure? If both HAVE and the classifier predicate function as verbs, sentence in (3a) contains two verbal projections and should have the properties of a biclausal structure. If classifier predicate is not a verb, the sentence should have the properties of a monoclausal structure.

The negative test. A monoclausal structure is easy to distinguish from a biclausal structure, since a monoclausal structure may contain only one sentential negation and may not express reference to two conflicting event-times. In a biclausal structure, on the other hand, each of the clauses may be negated. According to my informants' grammaticality judgements, classifier predicates within transitive constructions with additional verb HAVE cannot be negated (compare grammatical (4a) to ungrammatical (4b) and (4c)). I conclude that this is because the sentences (4a–4c) are monoclausal – especially since SZJ classifier predicates may be negated when (overt) HAVE does not appear in the sentence (4d).

(4) a.
$\overline{\qquad}^{\text{HS}}$ $\overline{\qquad}^{\text{EB}}$ $\overline{\qquad}^{\text{BS}}$
WOMAN NOT-HAVE TWO BOOK$_a$ HOLD-CL(C)$_a$ (SZJ; dm30)

 b.
$\overline{\qquad}^{\text{HS}}$ $\overline{\qquad}^{\text{EB}}$ $\overline{\quad}^{\text{HS}}$ $\overline{\qquad}^{\text{BS, HS}}$
*WOMAN NOT-HAVE TWO BOOK$_a$ NOT HOLD-CL(C)$_a$ (SZJ; dm31)

 c.
$\overline{\qquad}^{\text{EB}}$ $\overline{\quad}^{\text{HS}}$ $\overline{\qquad}^{\text{BS, HS}}$
*WOMAN HAVE TWO BOOK$_a$ NOT HOLD-CL(C)$_a$ (SZJ; dm32)

 d.
$\overline{\quad}^{\text{HS}}$ $\overline{\qquad}^{\text{EB}}$ $\overline{\quad}^{\text{bs}}$
WOMAN NOT TWO BOOK$_a$ HOLD-CL(C)$_a$ (SZJ; dm29)
‘A/the woman does not hold two books.’

Classifier predicate as a small clause. Since classifier predicate cannot be negated in (4b) and (4c), it does not qualify as the head of a verb phrase. Such a conclusion does not rule out the possibility that SZJ classifier predicate projects a reduced clausal structure. I analyze these SZJ classifier predicates as non-verbal predicates that form a small-clause structure assuming that classifier small clause is selected by an overt (have) or – in case of (4d) – a covert verbal head. This proposal explains the complexity of classifier predicates. Being a non-verbal projection, classifier predicate fails to move with a verbal V-to-T movement and stays in situ. For SVO languages such as SZJ, this analysis correctly predicts the change from the basic SVO (1a) to the non-basic SOV for transitive classifier predicates (1b)) and from the basic SVOdOi (2a)) to the non-basic SOdVOi

(2b) for ditransitive classifier predicates.

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WORD-INTERNAL COORDINATION IN HANDLING CLASSIFIER PREDICATES

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Introduction: Benedicto & Brentari [1] propose that classifiers determine the argument structure of classifier predicates (CLPs). In particular, whole-entity classifiers introduce a functional head f1 hosting an internal argument yielding an unaccusative predicate; body-part classifiers introduce a functional head f2 hosting an external argument which results in an unergative predicate; handling classifiers introduce both f1 and f2 producing a transitive predicate (1). We tested whether this analysis is also applicable to Russian Sign Language (RSL) CLPs, focusing on challenges posed by the behavior of handling CLPs in this talk.

Methodology: We analyzed handling CLPs in the RSL corpus [2]. It appeared that handling classifiers may be polysemous and occur in some non-standard contexts (see below). To confirm this behavior, we further elicited descriptions of 21 short animated movies administered to 10 native RLS signers, and grammaticality judgments from several signers.

Results: Our data reveal that in RSL, handling classifiers can be used not only to describe an Agent moving a Theme, as predicted by (1) (which we call regular handling, RH), but also in situations in which a participant is either holding on to a moving object and therefore moving himself (i.e. moving because holding, MBH), or is holding an object while moving independently (i.e. moving while holding, MWH) (2). This clearly indicates that the first argument (the man) does not have to be the Agent causing the second argument (the stick) to move. In addition, the structure in (1) does not account for the fact that, in RSL, the hand is a necessary participant in all situations described by handling CLPs: if the structure in (1) were correct, (3) should be grammatical (as (1) predicts caused motion but no direct handling), while it is clearly not.

Analysis: In order to account for the RSL data, we propose that handling CLPs that contain movement in fact involve a complex coordinate structure with two separate predicates. The following meaning is compatible with RH, MWH, and MBH: X holds Y by hand, and the hand moves. Instead of using CLP-specific functional projections f1 and f2, we employ predicate decomposition following Ramchand [3]. The structure that yields the correct compositional semantics and its interpretation is given in (4). In the left conjunct, the verb root BE.AT expresses the locative relation between the hand and the held object, and the handled object determines the particular hand configuration. The right conjunct contributes the movement component; its argument (the hand) is elided. Note that the left conjunct can also occur independently: we then get a handling CLP without movement describing a person holding an object (5). In our analysis, the hand is an argument, and it is incorporated into the left predicate. This explains why the hand has to be a part of the semantics (3), but cannot surface as an independent constituent in the sentence (6).

Discussion: Our analysis differs from Benedicto & Brentari's in three main respects. Firstly, it accounts for a wider range of uses of handling CLPs (of course, we cannot exclude the possibility that ASL CLPs behave differently from RSL ones). Secondly, it does not involve modality-specific functional heads f1 and f2, but makes use of independently motivated functional heads [3]. Finally, under our account, classifiers do not introduce arguments themselves, which also allows for a unified syntactic and semantic analysis for classifier and non-classifier predicates.

The internal structure of Handling CLPs we propose might appear to be modality-specific at the surface, as it involves the coordination of two independent predicates which are then realized as one sign. In spoken languages, however, coordination within a word, although less common, is also attested (e.g. coordinated compounds in the nominal (*hunter-gatherer*) and verbal domain (*to sleepwalk*)). Sign languages use the possibilities of simultaneous expression afforded by the visual modality to also express coordinated events word-internally: the handshape can describe one event and the movement a different yet related event.

Note: In all examples, the same handling classifier with the S-handshape is used: CL_hl(S). Location in CLPs is not represented in either glosses or syntactic structures.

(1)
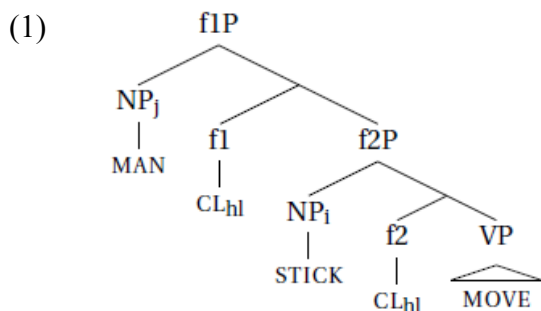
    MAN STICK CL_hl(S)-MOVE

    'The man moves the stick.'

    Compositional meaning: 'The man is causing the stick to move.'

(2)   MAN STICK CL_hl(S)-MOVE   [RSL]

    Possible interpretations:

    1. A man moves a stick with his hand (RH)

    2. A man is holding on to a moving stick, and therefore he is also moving (MBH)

    3. A man is holding a stick and is moving independently (MWH)

(3) * MAN DOG TABLE CL_hl(S)-MOVE   [RSL]

    Situation: The man shouts at the dog, and it runs from the table. *Intended interpretation, predicted by structure in (1)*: 'The man causes the dog to move from the table.'

(4)

&
- initP
  - Initiator
    - NP_j
      - MAN
  - init
  - procP
    - Undergoer
      - NP_i
        - CL_hl(s)(hand)
    - proc
      - BE.AT
    - Rheme
      - NP_k
        - STICK
- procP
  - Undergoer
    - ~~HAND~~
  - proc
    - MOVE
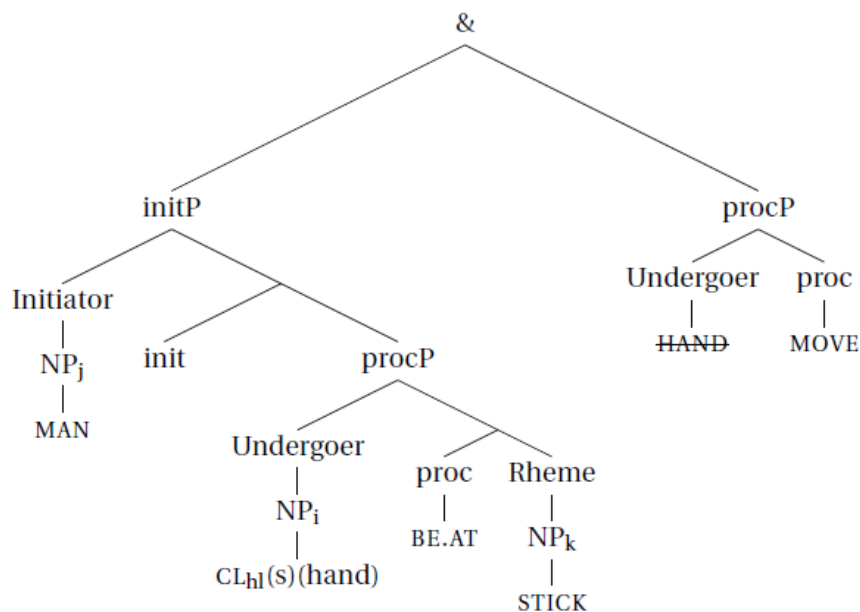
Compositional meaning: 'The man is causing his hand to be at (around) the stick, and the hand moves.'

(5) MAN STICK CL_hl(S)   [RSL]
'The man is holding the stick.'
Compositional meaning: 'The man causes his hand to be around the stick.'

(6) * MAN HAND STICK CL_hl(S)-MOVE   [RSL]
Intended meaning: 'The man moves a stick with his hand.'

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FACTORS FAVORING INSTRUMENT PROMOTION IN SIGN LANGUAGE PREDICATES

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Introduction. This work is part of a larger crosslinguistic project examining the conditions that determine which arguments are expressed in classifier and activity predicates. Continuing with previous work on the argument structure of classifier predicates (Padden 1983, Schick 1987, Kegl 1990, Zwitserlood 2003, Benedicto & Brentari 2004),we report here on the conditions that facilitate promotion of the instrument argument. We base our study on previous work showing that handling classifier handshapes typically express agentive grammatical subjects and object classifier handshapes typically express grammatical objects; however, pilot work suggests that some sign languages may not use handling handshapes in all agentive contexts. Italian Sign Language (LIS) is suggested to be one such language (Brentari et al. 2015). We define "promotion" as the expression of an argument by the handshape of the dominant hand in an unexpected context.

Proposal. We hypothesize that markedness facilitates promotion of the instrument argument within the predicate, even in an agentive clause. "Markedness" here refers to both to i) *phonological markedness* of handshape complexity (Brentari 1998) and ii) the *typicality* of the event/instrument pair, that is, whether or not a specific instrument is commonly used or effective for a specific action. We propose that a marked object (within an event) is more salient than an unmarked object and results in the promotion of the instrument in the predicate over the agent. We expect these two factors to be additive in that the object is most marked when both the handshape and typicality conditions are conjoined.

Methodology. In this study, descriptions of 58 short vignettes produced by a native LIS signer were analyzed, using the simple instruction, "describe what you see". We manipulate both the object's handshape complexity and the typicality of the object being used as an instrument. Following Brentari et al. (2012) for ASL we divide handshape complexity into low (e.g.,), medium (e.g.,), and high (e.g.,), categories based on the selected fingers used. There are also 4 agentive vignette types: i) locative (e.g. *person-place-pen-on-head*), ii) typical (e.g., *person-stir-with-teaspoon*), iii) atypical, successful (e.g. *person-stir-with-scissors*), and iv) atypical, unsuccessful (e.g. *person-open-can-with-(toy)train [used as a lever]*). The typicality was determined using a survey of 7 judges including signers and non-signers.

Results. The analysis of the LIS data collected confirmed our hypothesis. Figure 1 shows an object classifier used in an atypical agentive event, i.e. *person-stirring-with-(toy)plane*. Both factors are atypical: a medium complexity handshape and an atypical event.

Figure 1.CUP   [CL: SASS_LOC] ᵥₚ   TEA   PLANE   **[CL:PLANE+STIR]**ᵥₚ

If we compare the atypical event *person-stirring-with-(toy)plane* in (1) to typical events, a handling, rather than object, classifier handshape surfaces—e.g., *person-stirring-with-teaspoon* in (2) or *person-move-plane-through-air* in (3).This difference in the distribution of handshape type in (1) vs. (2-3)—is evidence of promotion of the instrument argument in the atypical case.

(1)   CUP   [CL: SASS_LOC] ᵥₚ TEA   [**CL:Object**+STIR] ᵥₚ   (atypical)

(2)   CUP   [CL: SASS_LOC] ᵥₚ TEA   [**CL:Handling**+STIR] ᵥₚ   (typical)

(3)   PLANE   [**CL:Handling** + MOVE] ᵥₚ   (typical)

More generally, we find that LIS is more likely to use an object classifier in the VP (a) in atypical events and (b) with items whose object classifier handshape is in the medium or high complexity groups.

(a) Event/Instrument Pair Typicality	Object Classifier	Handling Classifier
(Locative Event)	75%	25%
Typical	48%	52%
Atypical Good	66%	34%
Atypical Bad	80%	20%
(b) Handshape Complexity	**Object Classifier**	**Handling Classifier**
Low	45%	55%
Mid	83%	17%
High	62%	38%

Table 1: Event (typicality) (a) & Phonological (handshape) effects (b) on classifier handshapes

Our findings suggest that typicality has a stronger effect than handshape complexity on the expression of LIS instruments in the VP, or, alternatively, that LIS does not distinguish between successful and unsuccessful atypical events, or between medium and high complexity handshapes for the instrument in the stimuli. Table 2 shows which classifier is more preferable when the two factors combined are taken into account:

Combined measure	Low	Mid	High

(Locative Event)	Object or Handling	Object or Handling	Object or Handling
Typical	Object or Handling	Object or Handling	Object or Handling
Atypical Good	Object	Object	Object
Atypical Bad	Handling	Object	Object

Table 2: Additive effects on classifier handshape

Implications and further work. Overall, we find that markedness promotes an object handshape in classifier and activity predicates. We expect to find different crosslinguistic patterns in which the instrument may or may not be promoted to argumenthood. Additionally, we suspect that inherent instrumentality of a verb (see Koenig et al., 2008 and Rissman, 2013) might be a third factor that demarcates the extent of instrument promotion. We plan to extend this study to four other sign languages (American SL, British SL, Hong Kong SL and Turkish SL) prior to the conference and report on any crosslinguistic differences found.

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REPRESENTATION OF EVENT SEMANTICS IN PREDICATE SIGNS AND GESTURES

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Background. In the real world, the structure of events may vary. For example, events may have natural endpoints (walk a mile) or not (wander around). Moreover, the language we use may reflect these differences: *I walked a mile in 20 minutes* is an acceptable English sentence but *I wandered around in 20 minutes* is not. In sign languages, the phonological form of the signs themselves may overtly and transparently encode these differences. In American Sign Language (ASL), for example, verbs describing events with natural endpoints (telic) tend to be produced with visuo-spatial end-marking of the sign form (Wilbur 2003, Wilbur and Malaia 2008). Similar patterns have also been documented in the formational properties of predicative signs in other sign languages (e.g., Malaia, Wilbur, Milković 2013) and perception studies show that hearing non-signers sensitive to the formational markers of event structure in sign languages (Strickland et al. 2015). Though event structure is a universal linguistic property, one that is almost certainly based in how the world works and how we think about the workings of the world, form-meaning mappings of this type do not appear to be attested in spoken languages. Given this apparent modality-specific effect, the present research addresses two questions:

[Q1:] How extensive and systematic are these formational patterns within a sign language?

[Q2:] What are the communicative origins of this sign-specific use of linguistic form?

Predicate Inventory. The studies presented here are based on a predicate inventory developed from the English language predicates used by Malaia et al. (2009, 2012). Predicates (200) were selected to vary by telicity and transitivity, resulting in four predicate types: atelic-potentially intransitive (47), atelic-transitive only (49), telic-potentially intransitive (48), and telic-transitive only (56).

Systematicity of Event Representations Across the Lexicon. Existing research on the form-meaning mappings of event structure in sign languages is based on fieldwork data or small experimental studies and is primarily concerned with the systematic marking of telicity, leaving open questions concerning how extensive these patterns are within the language and whether or not other event structural properties are also systematically used. Using a publicly available cross-linguistic sign language dictionary (spreadthesign), we created a database of ASL signs corresponding to the translations of the English predicate inventory described above. Excluded from the list of 200 predicates were predicates for which no ASL translation was available, predicates with fingerspelled translations, and predicates that are ambiguous between nouns and verbs in English but only have a nominal usage in ASL (e.g., nurse). This resulted in a database of 143 predicates, 24 of which had two distinct ASL translations (167 predicate videos total; atelic-potentially intransitive (48), atelic-transitive only (42), telic-potentially intransitive (40), and telic-transitive only (37)). Two hearing non-signers coded each of the videos on a 7 point scale for the

degree to which the predicate sign contained formational end-marking ('gesture boundary') and repetition, as well as the extent to which a sign was perceived as being composed of multiple sequential gesture parts ('composite'). Videos were pre-processed to block the face of the signer to ensure that lexical information from concurrent mouthing was not available to the coders and were coded by each coder in two distinct random orders (four orders total). Interclass co-efficients for inter-rater reliability were .47 for gesture boundary, .95 for repetition, and .74 for compositeness. We examined the extent to which each of these formationally parameters is systematically associated with either event telicity or event transitivity. As expected, we found statistically significant associations between telicity and boundedness and atelicity and repetition. Telic verbs have higher gesture boundary scores (p < .001) and atelic verbs have higher repetition scores (p < .001). Because event telicity is frequently associated with a change of state of an object argument, we next asked whether the telicity effects were a result of event or argument structure. We found no association between transitivity and either gesture boundary or repetition; moreover, linear models revealed that both of the aforementioned form patterns were driven by telicity alone. We respect to compositionality, however, significant effects were found for both telicity and transitivity. Higher ratings for compositionality are found with both telic predicates (p =.003) and transitive-only predicates (p = .02) and linear models show that both telicity and transitivity are significant predictors of compositionality. These results support the expansion of both the event structural properties and the formational parameters explored in these and similar studies. Moreover, they suggest a cline in which telic-transitive only events in ASL are most likely to be produced with distinct sign segments representing the distinct components of the event semantic structure.

Origins of Event Representation. Because this pattern is robust across sign languages and only sign languages but nevertheless accessible to hearing non-signers (Strickland et al. 2015), it may have its origins in gestural communication. Indeed, Parrill, Bergin, and Lichtenstein (2013) found that gesture duration and gesture iteration were affected by grammatical aspect (perfect/progressive), a property that may be constrained by but is not identical to event structural properties such as telicity. We investigated this aspect of event representation in gesture by presenting the full set of 200 predicates to hearing nonsigners and asking them to express the meaning of the predicate without using speech. Preliminary results suggest that hearing non-signers associate gesture repetition with atelicity, as signers do. Compositionality, however, appears to be primarily associated with event telicity, not transitivity.

Conclusions. Together, these results enhance our understanding of the form-meaning mappings of event structure in sign languages. Though these mappings may have origins and correlates in gestural communication, they may diverge from gestural patterns once the event representations are grammaticalized as part of a linguistic system.

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BARE NPS AND NUMBER SPECIFICATION IN ASL

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Much work in semantics has been dedicated to the issue of bare nouns, with respect to their (in)definite readings, mass/count distinction, kind/individual readings. Chierchia (2010) argues that the main characteristic driving the cross-linguistic typology is number; he presents three types of languages which differ along the aforementioned criteria: (A) languages like English; (B) languages like Mandarin; and (C) languages like Dëne Sųłine. The difference is between these three classes lies in number marking. In group (A), nouns carry number morphology overtly, and the mass/count distinction is connected to this number marking. In group (B), nouns are bare but no noun is able to combine with number directly; in order to express number, nouns combine with obligatory classifiers (Cheng & Sybesma 1998), and the mass/count distinction is coded in the grammar through the syntax and semantics of classifiers. Group (C) forces neither obligatory number morphology nor intervening classifiers when it comes to combining a noun with number. These languages Cheirchia dubs 'number neutral.' We examine ASL nouns and demonstrate that the language belongs to group (C). Additionally, the data suggest that the mass/count distinction in terms of noun classes is best diagnosed with tools other than individuation and plurality (Chierchia 1998, 2010; i.a.).

First, Petronio (1995) observes that the quantificational value of the ASL noun is always optional and not encoded on the NP but somewhere else in the sentence. In fact, nouns generally can be interpreted as either singular or plural (1a). By the same token, when number is indicated (via 'reduplication', e.g.), it is interpreted differently from languages with obligatory marking: the singular interpretation of (1b) is felicitous in English (Sauerland 2003) but not in ASL.

(1)   a. CHILD a-GO-b   'Children/child went (from one place to another)'

       b. A: HAVE TREE+++ HERE   'Are there trees here?'

          B: YES   'Yes' = there are trees here/ #there is one tree here

In other words, ASL behaves differently than languages in group (A).

Second, nouns in ASL are bare: *IX*, typically assumed to serve as the definite article (MacLaughlin 1997), does not qualify as an overt realization of the iota-operator, since it can occur in neither (global) uniqueness nor anaphoricity/familiarity contexts (2) (Koulidobrova & Lillo-Martin 2016).

(2)   1-IX GO CHURCH SEE (*IX) PRIEST. (*IX) PRIEST SMART

       'I'll go to church and see the priest. The priest is smart'

Nouns in such languages have been argued to be mass, requiring a classifier before they can combine with a numeral (Chierchia 1998, Cheng & Sybesma 1998, i.a.). Nouns in ASL, however, like nouns in Dëne Sųłine, do not rely on classifiers for individuation (Abner 2012, e.g.) and can combine with both numerals and 'stubbornly distributive' (Schwarzschild 2011, Maldonado 2012) predicates like *large* freely (3)-(4).

(3)   a. saⁿ   *(zhı̄) xı́ong   (Mandarin; Krifka 1995, 399)
          three   *cl.*   *bear*   'three bears'

b. so ɬa˴́ghe   k'a˴́sba   (Dĕne Sųłine; Wilhelm 2008)
five   *chicken*   'five chickens'

(4)   a. 3 BOY BUY 2 CAR BIG   'Three boys bought two large cars'

       b. 2 CAR BOY BUY IX$_{arc}$ BIG   'The two cars that boys bought are large'

The sentences in (4) have a number of readings, among which are that 3 boys each have bought 2 cars, and that the 3 boys have pooled their resources and purchased 2 cars total. In other words, ASL nouns are individuated without the assistance of a classifier and, thus, the language does not belong to group (B) but to group (C).

We subject ASL nouns to a variety of diagnostics (Bale & Barner 2009, Chrierchia 2010, Smith 2015, i.a.) and offer additional evidence for number neutrality: e.g., singular and plural readings of mass ('fake' and typical) nouns cannot be considered distinct semantically (since conjunction preserves such specification, Cruse 1986, i.a), e.g. (5).

(5)   a. JOHN a-IX MARY b-IX SEE GOLD   'John and Mary saw gold'

       = J and M each see a chunk of gold

       = J and M each see set of gold objects

       = J sees a chunk of gold and M a larger set of gold objects…

       b. JOHN SEE HORSE MARY SAME   'John saw a horse/horses, and Mary did too'

       = J saw 1 horse and M saw multiple horses

       = J saw multiple horses and M saw 1 horse

Additionally, we demonstrate that unlike what has been observed in other 'general number' languages (Corbett 2000, Aikhenwald 2003, Wilhelm 2008, Nakamoto 2014, i.a.), numerals and *large/small* can combine not only with count-nouns (4) but also with mass (both typical and 'fake') nouns (6)-(7), which suggests the lack of mass/count distinction.

(6)   GIVE-1 3 GOLD / SAND/ MEAT/ FURNITURE

       'Give me 3 (units of) gold/sand/ meat/furniture'

(7)   a. MARY BUY GOLD BIG   'Mary bought large gold'

       = Mary bought a massive chunk of gold / = Mary bought a huge pile of gold pieces

       b. GOLD IX-a SMALL   'That gold there is small'

       = the chunk of gold is small

       = the pile of gold pieces is small

       = the set of gold items consists of small objects

However, we show that the mass/count distinction still holds in ASL: individuated vs. non-individuated distinction is preserved with *more* (8)-(10) and reduplication encoding plurality is accepted only only for count nouns (11).

 (8)   a. Anna has more furniture / books

       = nu of individual pieces / ≠ size of individual units

       b. Anna has more food/pizza/water

       = nu of individual pieces / = size of individual unit

(9)   a. ANNA HAVE MORE FURNITURE / BOOK   'Anna has more furniture/books'

= nu of individual pieces / ≠ size of individual units

    b. ANNA HAVE MORE GOLD   'Anna has more gold'

= nu of individual pieces / = size of individual units

(10)   JOHN a-IX MARY b-IX SEE MORE GOLD   'John and Mary see more gold'

    = J and M each see a bigger chunk of (a larger volume) of gold

    = J and M each see a larger set of gold objects

    ≠ J sees a bigger chunk of gold and M a larger set of gold objects

(11)   a. TREE+++/BOOK+++

    b. *OIL+++/SAND+++

We thus conclude that a) an account of cross-linguistic variation may lie with quantifiers, not syntax or semantics of nouns themselves (e.g. Wilhelm 2008, i.a.), and b) that the typically employed diagnostic tools for count/mass distinction do not suffice.

WHEN ONE PATTERNS SOMEONE: DEFINING THE PROPERTIES OF TWO INDEFINITE PRONOUNS IN CATALAN SIGN LANGUAGE (LSC)

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Motivation. It has been commonly assumed in the sign language literature that DPs are associated with spatial loci localized on the horizontal plane of signing space [2]. Here we examine two pronominal forms in Catalan Sign Language (LSC), both signed in a high locus (indicated in the glosses with the subscript *up*). The first pronoun combines the interrogative particle WHO and the quantifier SOME (1). The second is the numeral sign ONE (2). In LSC high loci are associated with non-specificity, and the two pronominal forms studied here are interpreted non-specifically.

(1)   **ONE$_{up}$** HOUSE ENTER STEAL$_{bim}$.

  'Someone broke into the house.'

(2)   **WHO^SOMEup** GO INDIA VACCINATE MUST.

  'When one goes to India one must get vaccinated/

  When someone goes to India he must get vaccinated.'

In this paper, we examine the semantic properties of the two pronouns to establish whether these forms should be analysed as indefinite pronouns or as impersonal pronouns (as English *one*, French *on,* or German *man)*.

Data. We use the following diagnostics proposed to distinguish indefinites from indefinite uses of impersonal pronouns [1]. Indefinite pronouns are (i) incompatible with a generic reading in simplex sentences, (ii) trigger disjoint reference when the pronoun is repeated in anaphoric chains and (iii) have narrow and wide scope interpretations with respect to adverbs like *twice*. In contrast, impersonal pronouns (i) are compatible with a generic reading, (ii) typically allow joint and disjoint reference when the pronoun is repeated in anaphoric chains and (iii) have narrow scope interpretation in their existential uses.

  (i) Generic vs. episodic reading. The two LSC pronouns may appear in generalizing as well as episodic contexts. In locative universal contexts as in (3) the null subject triggers a generic reading in LSC (3). When WHO^SOME$_{up}$ is used in this context the episodic reading arises (4a) and the subject need not be singular. The insertion of ONE$_{up}$ in the context triggers a habitual reading of the predicate, with existential interpretation of the individual, which has to be singular (4b). For predicates associated with a designated subject like (5), impersonal pronouns that allow existential readings allow a reading corresponding to "they raised taxes". This is not possible with WHO^SOME$_{up}$ and ONE$_{up.}$

(3)   CHINA AREA ⌀ EAT CAT.

  'In China they eat cats.' (they = people in general)

(4)   a. CHINA AREA **WHO^SOME$_{up}$** EAT CAT.

   'In China someone ate a cat/cats.' (can be more than one person)

  b. CHINA AREA **ONE$_{up}$** EAT CAT.

'In China there is someone who eats cats.' (one person only)

(5)   **WHO^SOME$_{up}$ / ONE$_{up}$** RAISE TAXES.

    'Someone raised taxes.' (not: "They raised taxes", they = the people charged with deciding taxes)

For the individual to be interpreted as generic, ONE$_{up}$ requires a circular movement in signing space (ONEmov$_{up}$), which expresses a quantified interpretation of the subject.

(6)   **ONEmov$_{up}$** MOMENT CHINA ALWAYS EAT CAT.

    'When one is in China always eats cats.'

(ii) Anaphora. In coreferential chains, the repetition of ONE$_{up}$ and WHO^SOME$_{up}$ trigger disjoint interpretation (7/8) (different people in hospital and worrying). This differs from impersonal pronouns (such as English *one*, French *on,* German *man)* that allow co-referent interpretation of repeated pronouns (9).

(7)   **ONE$_{up}$** MOMENT HOSPITAL GO, **ONE$_{up}$** ALWAYS THINK RESULT WORST.

    'When one$_k$ is admitted to the hospital, one$_j$ always fears the worst results.'

(8)   **WHO^SOME$_{up}$** HOSPITAL GO, **WHO^SOME$_{up}$** ALWAYS THINK RESULT WORST.

    'Someone$_i$ is admitted to the hospital; someone$_k$ always fears the worst results.'

(9)   When **one$_i$** goes to hospital **one$_i$** always fears the worst.

(iii) Scope. The use of WHO^SOME$_{up}$ allows wide and narrow scope readings with respect to the adverb (10), with wide scope for the pronoun preferred (10a). In contrast, the use of ONE$_{up}$ only allows a wide scope reading (11). This contrasts with existential uses of impersonal pronouns, like *on* and *man*, which have obligatory narrow scope wrt the adverb (12). In fact, in LSC the establishment of two different loci for the subject explicitly marks distribution over the subject, resulting in a reading with the indefinite subject co-varying with stealing events (like in a narrow scope reading). Scope variation of simplex subjects in LSC has to be distinguished from explicit marking of distribution over the subject done by placing iterated subjects in different loci in signing space.

(10)   **WHO^SOME$_{up}$** IX1 BIKE 1-STEAL-3$_{up}$++ TWO TIMES.

    'Someone stole my bike two times.'

    a) someone > 2 times (preferred)

    b) 2 times > someone

(11)   **ONE$_{up}$** BICYCLE 1-STEAL-3$_{up}$++ TWO TIMES.

    'Someone stole my bicycle two times.' (someone > 2 times)

(12)   **On** a volé mon vélo deux fois. (Fr)

    'ON stole my bike twice.' (2 times > someone)

Outcome. With respect to tests (i)-(iii), the pronouns WHO^SOME$_{up}$ and ONE$_{up}$ pattern with indefinite pronouns comparable to English *someone* and unlike indefinite readings of impersonal pronouns. However, the two indefinite pronouns differ with respect to other properties. First, examples like (4a/b) above show that WHO^SOME$_{up}$ and ONE$_{up}$ differ with respect to the

cardinality of the referent: while WHO^SOME$_{up}$ is number neutral, ONE$_{up}$ is interpreted as referring to a singular referent. Furthermore the two pronouns favour different aspectual interpretations: with a WHO^SOME$_{up}$ subject the object is interpreted as specific and the predicate as telic (14a), with ONE$_{up}$ the predicate is interpreted as atelic with a non-specific object (14b).

(14)   a. **WHO^SOME$_{up}$** EAT CAT.

'Somebody ate the/a cat.' (telic; specific interpretation of the object)

b. **ONE$_{up}$** EAT CAT.

'There is one who eats cats. ' (atelic; non-specific interpretation of the object)

The pronoun ONE$_{up}$ is interpreted as a strong indefinite while WHO^SOME$_{up}$ is a weak indefinite. In (14b) the indefinite is interpreted as partitive: the speaker reports that the agent is an unknown individual from an identifiable group. This domain restriction is not found for WHO^SOME$_{up.}$

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ADJUNCT SUBORDINATE: THE CASE OF TEMPORAL CLAUSES IN LIS

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Background. Subordination is a key structural property of human language, which is based on the fundamental merge operation (Chomsky 1995). The difficulties that sign language has in displaying clear evidence for sentential argument subordination depend both on the absence of clear manual subordinate markers, and on processing factors facilitating extraposed construc- tions (Geraci & Aristodemo, 2016). Center embedding of sentential complements in LIS is possible only if the resulting structure is strongly marked at the morphological level (Geraci & Aristodemo, 2016). Part of these difficulties also extends to some cases of adjunct sub- ordination. Specifically, if-clauses display typical yes/no prosody on the antecedent of the conditional, hence leaving a bi-clausal analysis hard to exclude (Barattieri 2006).

Goals. We investigate temporal clauses in LIS (i.e. before, after and when-clauses) and we show that these are genuine cases of adjunct subordination rather than juxtaposed or coordi- nated structures. Data: Data are from two LIS native signers. The baseline for temporal clauses is given in (1-3). The main properties are the following: i) raised eyebrow non-manual marking (NMM) spreads on the temporal clause (as in if-clauses); ii) temporal markers BEFORE, AFTER and MOMENT prosodically belong to the second part of the construction (evidence for this is taken from the spreading of the NMM); iii) Before-clauses contain the presuppositional negation NOT-YET (Geraci 2006); iv) inversion of the two members of the construction is not allowed.

        <u>   </u>er

(1)   a. BOSS STOCK SELL NOT-YET BEFORE SECRETARY STAMP BUY

        'The secretary bought the stamps before the boss sold the stocks'

        b. *BEFORE SECRETARY STAMP BUY BOSS STOCK SELL NOT-YET

        'Before the boss sold the stocks, the secretary bought the stamps '

        <u>   </u>er

(2)   a. BOSS STOCK SELL DONE AFTER SECRETARY STAMP BUY

        'The secretary bought the stamps after the boss sold the stocks'

        b. *AFTER SECRETARY STAMP BUY BOSS STOCK SELL DONE

        'After the boss sold the stocks, the secretary bought the stamps'

        <u>   </u>er

(3)   a. WHEN BOSS STOCK SELL (MOMENT) SECRETARY STAMP BUY

        'The secretary bought the stamps when the boss sold the stocks'

        b. * (MOMENT) SECRETARY STAMP BUY WHEN BOSS STOCK SELL

        'When the boss sold the stocks, the secretary bought the stamps'

Evidence that the examples in (1-3) are not barely juxtaposed independent clauses comes from the

fact that when the first part of the construction is used in isolation, the NMM never appears (the when-clause in example (3a) would be ungrammatical in isolation). Despite the NMM is similar to the one found in if -clauses, a question-answer analysis a la` Caponigro and Davidson (2011) is not compatible for semantic reasons. In order to disentangle whether these are cases of syntactic coordination or subordination, we use evidence from wh-extraction. If it is coor- dination, then Across the board (ATM) movement should possible, but asymmetric extraction should not be possible. If it is subordination, then extraction from the matrix clause should be possible, but extraction from the subordinate adjunct should not be possible because it would violate the adjunct island constraint (Ross 1967). The data in (4) seem to show that ATB move- ment is possible. However, the data in (5-7) show a different picture. They show that the constructions are sensitive to the adjunct island constraint and that the second member of the construction behaves as the matrix clause. (not shown here, short movement of the wh-phrase before the temporal marker is also ungrammatical in 5 - 7).

(4)   a. ___ STOCK SELL NOT-YET BEFORE ___ STAMP BUY WHO?
        'Who bought the stamps before selling the stocks?'
        b. ___ STOCK SELL AFTER ___ STAMP BUY WHO ?
        'Who bought the stamps after selling the stocks?'
        c. WHEN ___ STOCK SELL (MOMENT) ___ STAMP BUY WHO?
        'Who bought the stamps when sold the stocks?'
(5)   a. BOSS STOCK SELL NOT-YET BEFORE ___ STAMP BUY WHO?
        'Who bought the stamps before that the boss sold the stocks?'
        b. * ___ STOCK SELL NOT-YET BEFORE SECRETARY STAMP BUY WHO?
        Int. mean.: 'Who is s.t. before selling the stocks the secretary bought the stamp?
(6)   a. BOSS STOCK SELL AFTER ___ STAMP BUY WHO?
        'Who bought the stamps after that the boss sold the stocks'
        b. * ___ STOCK SELL AFTER SEGRETARY STAMP BUY WHO?
        Int. mean.: 'Who is s.t. after selling the stocks the secretary bought the stamp?
(7)   a. WHEN BOSS STOCK SELL ___ STAMP BUY WHO?
        'Who bought the stamps when the boss sold the stocks?'
        b. *WHEN ___ STOCK SELL SECRETARY STAMP BUY WHO?
        Int. mean.: 'Who is s.t. when he was selling the stocks the secretary bought the stamp?'

Analysis. The analysis is based both on Cinque (1999) and Del Prete (2008). The relevant syn- tactic projection hosting the adjunct temporal clause also includes a degree phrase, as in Del Prete's analysis of before-clauses in Italian. This degree phrase allows to establish the relevant comparison between the status of the event in the main clause and the status of the event in the subordinate clause. The position where adjuncts clauses are merged also hosts the temporal adverb (BEFORE, AFTER, MOMENT). The temporal clause then moves to a higher topic po- sition stranding the

temporal adverb. This movement is made visible by the topic-like NMM spreading over the adjunct clause. The fact that the NMM does not spread over the adverb is evidence that it is left in situ. This configuration generates the adjunct island effect observed in (5-7). We interpret the apparent cases of ATB extraction in (4) as involving null subjects in the temporal clause (see Geraci 2007 for a similar analysis in comparative correlatives). Conclusions. Temporal clauses show a clear case of adjunct subordination in LIS. The sub- ordinate clause is marked by a NMM indicating a generalized fronting phenomenon as also documented in (co-)relative constructions in LIS (Cecchetto et al. 2006). We will tentatively extend the analysis by considering the role of the aspectual markers in the construction (e.g. why the presuppositional negation, rather than standard negation has to be used in before con- struction). We will also investigate the semantic contribution of the degree phrase and how it relates to standard cases of comparatives.

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EMERGENCE OF A SUBORDINATE CONSTRUCTION IN A SIGN LANGUAGE:
INTONATION PLOUGHS THE FIELD FOR MORPHOSYNTAX

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A central question in historical linguistics is how subordination emerges. Many linguists have hypothesized that diachronically subordinate constructions start off with intonational signals, and that these precede morphosyntactic markers of subordination (Givón 2012, Mithun 2009 *inter alia*). Contemporary spoken languages cannot provide a testing ground for this hypothesis because all of them have fully grammaticalized subordinate constructions. However, a young sign language, such as Israeli Sign Language (ISL), is perfectly suited for this purpose (Meir and Sandler 2008). In ISL, relative clauses are usually marked by squinted eyes and a forward head position, which have been shown to perform the functions of intonation (Sandler 1999; Dachkovsky, Healy and Sandler 2013), as well as by a manual demonstrative form appearing at the relative clause boundary.

Yet, consistent marking of relative clauses in the language is characteristic of the younger signers' but not of the older signers' language. This suggests that relative clause marking developed over time in the language, which leads us to ask how it emerged and developed. The present study tracks the emergence of the relative clause (RC) construction by investigating changes in intonational and morphosyntactic signals across three generations of ISL signers. The study demonstrates that these signals begin as pragmatic or, more specifically, as information structuring devices, and are transformed by a grammaticalization process into RC markers. Furthermore, we show that intonational cues in the newly emerging RCs pave the way for a morphosyntactic marker.

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. In order to deduce and evaluate changes, the behavior of intonational signals and segmental elements was analyzed in accordance with three basic criteria of grammaticalization: (1) degree of obligatoriness, (2) functional change and (3) phonetic strength (e.g., Hopper & Traugott 1993).

The results show that the RC construction emerges through a gradual and consecutive transformation of two intonational components -- 'forward head movement' (FHM) and 'squint' -- from information structuring devices at the earliest stages (Ex. 1) to RC markers later on (Ex. 2). Specifically, FHM in the older group of signers functions as a topic marker, and is usually aligned with the nominal only. But starting with the second generation, the scope of FHM spreads to include both the nominal and the RC, relaxing before the following, main clause. This change demonstrates that FHM creates clausal asymmetry, which lies at the heart of subordination. Similarly, squint, originally signaling Low Accessibility status of the referent (Ariel 1990) in the older signers' topics, becomes, for the youngest signers, a grammatical marker of the RC construction by virtue of the spread of its scope to the RC.

A third marker of RCs is a pointing sign that occurs at the clausal boundary. Although pointing signs appear in all groups, their form and function change across the three groups of signers.

Whereas they function as fully articulated exophoric or endophoric pronouns in the older group's responses, once the RC crystalizes prosodically in the youngest group, the pointing signs move consistently to the prosodic boundary between the clauses and become phonologically and functionally reduced. As a result, the more advanced stage of the RC construction formation is characterized by the clustering of multiple intonational and morpho-syntactic signals at RC boundaries, which reinforces the internal cohesion of the whole construction.

In sum, the findings of the present study show that in the process of gradual emergence of the RC construction, its markers have been reanalyzed from signals of information structure into signals of construction-level dependencies. In addition, this research has important implications regarding the role of intonation in the emergence and development of subordination.

FHM
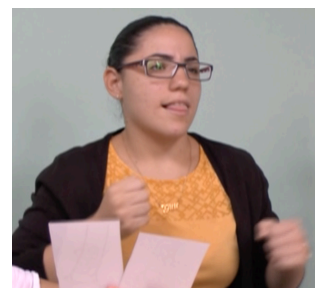squint
a) MAN b) LOOK c) COMB-HAIR

(1). Three chunks in the ISL older signer's response corresponding to the nominal (a), the first predication (b) and the second predication (c) in sentence
'*The man who is watching TV is combing his hair*'. The intonational signals are co-temporal with the topic of the utterance

FHM
squint
a) GIRL EAT-ICECREAM **INDEX**   b) SWING

(2) The nominal and the RC are marked by FHM and squint. A pointing sign appears at the boundary between the relative clause and the main clause in sentence '*The girl who is eating ice-cream is swinging*' produced by a younger ISL signer

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REVISITING THE NON-MANUAL MARKER 'BN' IN TİD

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The purpose of this study is to describe the specific functions of manual and nonmanual aspectual markers in Turkish Sign Language (TİD), BİT (finish) and 'bn', respectively. Previous studies (Zeshan, 2002, 2003; Kubuş, 2008; Gökgöz, 2009) mention the manual markers BİT (finish), SON (end) or HAZIR (ready) without discussing their specific aspectual functions. The non-manual marker is analyzed as a completive marker by Dikyuva (2011). However, this study focuses on only one of these manual markers, namely BİT, in addition to the non-manual marker 'bn'. The current study aims to show that the non-manual marker conveys more than just completive meaning, as argued by Dikyuva, and that a predicate expressing a [+telic, +stages] event is interpreted as the event having reached its endpoint if it occurs with the manual marker; BİT. Similarly, the non-manual marker shows that the event expressed by the verb it is attached to is perfective. This enables it to occur in various contexts such as past, perfect or passive-like constructions. These proposals about the true function of these two markers are supported by crucial findings: (i) the manual marker is compatible with accomplishment verbs and with a limited set of the so-called activity verbs, namely those that are inherently [+telic]; while (ii) the non-manual marker attached to an activity verb conveys the meaning of termination.

There are crucial findings which firstly show that these markers are distinct markers even though they co-occur simultaneously. First and foremost, they are compatible with different lexical aspectual categories. The manual marker occurs with a limited set of predicates; accomplishment and some of activity verbs. The consultants accepted the marker with all accomplishment verbs. However, they accepted it with some activity verbs like WASH BABY, READ BOOK or SLICE. On the other hand, it is incompatible with some like SWING BABY, RUN or BEAT. I will propose that the verbs in the activity category do not behave uniformly. The verbs which the marker can occur with behave like accomplishment verbs and they have [+telic] feature. With a little difference, the non-manual marker occurs with accomplishments and activities. The difference between the two is that the addressee understands that the event has reached its endpoint when it is signed with BİT. For instance, BİT is acceptable only when the subject finishes reading the book. The same case is interpreted as termination when it is signed with non-manual marker 'bn'. More clearly, the subject does not need to have finished reading the book. These situations show that in general terms, BİT is a completive marker while 'bn' is a perfective marker.

Another important difference is that the two occur in contexts which have different time reference. The non-manual marker 'bn' occurs with past and present time adverbials but neither with future time adverbials nor in future contexts. In contrast, the manual marker BİT occurs in the contexts which denote future although it does not overtly occur with future time adverbials. The following sentence is asked consultants in the context which you want to go out with your friend tonight, but

s/he says that s/he needs to study. Then you suggest that:

(1)   IX2   STUDY BİT   2INFORM1

     "When you finish study, let me know."

Although sentence (1) does not have an overt future time adverbial, it, unlike the nonmanual marker bn, is accepted in the future contexts. The sentence with bn becomes ungrammatical when it is tested for future reference. Future reference is one of the distinctions between the two markers and this shows that these markers are distinct markers.

Furthermore, the non-manual marker can have perfect readings as existential perfect or more commonly experiential perfect and perfect of result. The sentence (2) is actually ambiguous. One of the readings is that the subject is still Ankara and did not return to İstanbul. The other reading is that the subject has the experience of having been in Ankara at least once in her lifetime.

                                 ___bn

(2)   ZEYNEP ANKARA GO

     "Zeynep has gone to Ankara."

When we consider that the non-manual marker occurs with both perfect constructions and past time adverbials, I will propose that these readings, past and perfect, are actually driven from the structures rather than the marker itself. The marker conveys that the event marked by it is perfective, and it can occur in the probable contexts which perfective is compatible with. When we consider the constructions in the languages, this situation is not rare; Turkish, for example, has a morpheme -DI which can occur with different constructions and convey different readings (Arslan-Kechriotis, 2006). One more crucial finding of this study is that the perfective structures are negated with a non-manual marker, which is different from the case in other sign languages. Sign languages and some spoken languages are reported that the perfective sentences are incompatible with sentential negation (Meir, 1999; Rathmann, 2005; Meir & Wendy, 2008; Zucchi et al., 2010;). These languages (ASL, ISL, LIS for sign languages and Bagirmi for spoken languages) prefer another marker rather than sentential negation. Other sign languages are reported to have a manual marker for negative perfective sentences (ASL, LIS and ISL). Interestingly, TİD has a distinct non-manual marker for these sentences. In summary, this study analyzes the two BIT and 'bn' markers as viewpoint aspectual markers. The manual one expresses a subcategory of perfective by stating that a [+telic, +stages] event marked by it has culminated and reached its endpoint. The non-manual one is perfective marker and co-occurs in different contexts like past and perfect.

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MANIPULATING NONMANUALS IN A LEXICAL DECISION TASK: A REACTION TIME STUDY OF GERMAN SIGN LANGUAGE (DGS)

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The sign language native lexicon consists of various different sign categories. Core lexical signs can be either one- or two-handed and specified for nonmanual components or not. There is much research analyzing mouth actions as obligatory components of signs in different sign languages (cf. Woll 2001, 2014, Crasborn et al. 2008 etc.), however, comprehensive empirical and theoretical studies on other kinds of lexical nonmanuals are still scarce. Taking certain facial expressions of the lower and/or upper face and torso/head movements as inherent parts of specific lexical signs leads to the assumption that the processing of manipulated signs without these nonmanual markers would be more costly. The present lexical decision study investigates the status of lexical nonmanuals in German Sign Language (DGS) and presents an empirical basis for the discussion of whether and how nonmanuals are represented in the mental lexicon of signers.

Method: We conducted a reaction time experiment based on a forced choice lexical decision task. 17 deaf native and near-native signers (9 female, 8 men) between the age of 14 and 61 years participated in the study. In the programmed questionnaire, the participants watched 36 video stimuli of single signs, either in full citation form with lexical nonmanual marking or manipulated versions of these signs, which were manually identical, but without any nonmanuals. Apart from the factor *presence of nonmanual features*, a second factor *nonmanual sign types* was taken into account. We distinguished three different sign types: i) signs with lexical facial expressions, ii) signs with lexical facial expressions and torso/head movements, and iii) signs with lexical torso/head movements. This results in a six-condition design, where each condition pair is represented by six different signs that are commonly used in DGS. For the description of the facial muscular activities in the stimuli, the Facial Action Coding System (cf. Ekman, Friesen, and Hager 2002) is used. In addition to the 36 stimulus items, we interspersed 36 filler videos with the target items through a controlled randomization and created a second list in reversed order. Fillers were i) correct signs without lexical nonmanuals, ii) manually modified signs without lexical nonmanuals, iii) manually modified signs with lexical nonmanuals, and iv) signs merged from two signs by taking the manual components of one sign and the nonmanuals of another. Participants were fully instructed in DGS and had to choose between two words presented to them as soon as a stimulus or filler video was over (see Figure 1). Reaction times were measured from the word pair appearance to the selection of a word. A practice session and a familiarization with all of the answer words preceded the actual experiment. The criteria for the answer pairs were fit and non-fit, orthographical and phonological distance between both answer words and the corresponding signs, semantic unrelatedness, and same word class. The respective answer word pairs were randomized in terms of first fit and second fit, but the two signs of each sign pair (manipulated vs. non-manipulated) were always followed by the same answer pair and the same order of the answer words to control for

comparable reaction times. In total, the participants had to click equally often at the above words and the below words.

Results: Out of 612 reaction times that were collected for the critical items, we had to exclude 19 outliers due to independent reasons such as dialectal variation and less frequency in usage. The results were statistically analyzed by conducting a classical one-way analysis of variance (ANOVA) with R (cf. R Core Team 2015). Overall, the word choices for signs accompanied by their lexical nonmanuals are significantly faster (11%, $p = 0.002$) than signs lacking the nonmanuals. If we exclude three problematic items (BROKEN, BLURRY, and CONCENTRATE) that, e.g., revealed complications in translation due to homonymic relations, the effect becomes stronger and amounts to 13% ($p < 0.001$). Lexical nonmanuals in all of the three nonmanual sign types clearly belong to signs and have an impact on processing, facilitating comprehension. Regarding the nonmanual sign types, the greatest difference can be found in the stimulus group for body/torso movements (14%). In addition, we tested order effects to check whether it has an impact on the reaction times when signers see the second stimulus of a sign pair (either manipulated or non-manipulated). To capture the interdependencies between the two variables *order* and *presence of nonmanual features*, we used a two-way ANOVA. The average reaction times show that for the manipulated signs as well as for the non-manipulated signs the decision is faster when the participants see the second stimulus of a sign pair. Nevertheless, the difference in the reaction times for manipulated signs versus non-manipulated signs still survives in each group, i.e., for the firstly seen stimuli (9% slower for manipulated, $p = 0.039$) as well as for the secondly seen stimuli (12% slower for manipulated, $p = 0.017$). This regularity of the reaction times confirms the above results and, furthermore, is an indicator that the design of the study perfectly worked. Looking at age group differences by using a two-way ANOVA, this opens up the picture that older signers (5 participants) in general have more difficulties with the modified versions. Younger signers (12 participants) can compensate the lack of nonmanuals significantly faster, which is probably due to the general cognitive abilities of younger people.

This study is the first experimental approach to lexical nonmanuals in DGS and clearly shows the relevance of nonmanuals for lexical processing. The general effect of the faster processing of fully spelled-out non-manipulated signs versus manipulated signs lacking the nonmanuals leads us to conclude that specific nonmanuals clearly belong to the lexical entries of signs in DGS.
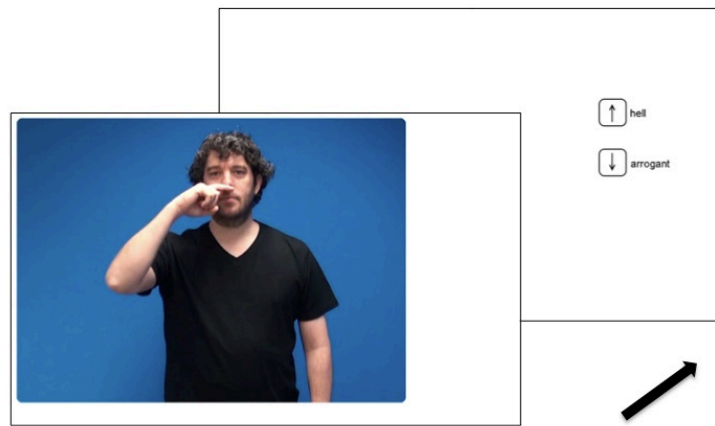
Figure 1: Design of the experimental questionnaire: initial point of the nonmanually manipulated sign ARROGANT with the two German answer words *hell* ('bright') and *arrogant* ('arrogant')

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POINTING TO THE RIGHT SIDE: AN ERP STUDY ON ANAPHORA RESOLUTION IN GERMAN SIGN LANGUAGE

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Background: In sign languages, discourse referents (DRs) are introduced and referred back to by means of referential locations (R-loci), i.e. regions in the horizontal plane of the signing space, which are identified either by overt grammatical (manual or non-manual) localization strategies such as pointing, body movement, and eyegaze or by covert default strategies (Sandler & Lillo-Martin 2006, Barberà 2012, Geraci 2013, Steinbach & Onea 2015). Hosemann (2015) and Hänel-Faulhaber et al. (2014) are the first studies on the processing of R-loci with agreement verbs. Note, that in both studies, the R-loci have been overtly introduced by the pointing sign INDEX. However, the default constraints on the assignment of DRs to R-loci and the resolution of spatial anaphora in sign languages have not been investigated from an experimental perspective so far. The present event-related potential (ERP) study on German Sign Language (DGS) investigates the hypothesis that signers assign distinct and contrastive R-loci to different DRs even in the absence of any overt localization strategy. Following the DRT-analysis developed in Steinbach & Onea (2015), we assume that signers systematically exploit the signing space to distinguish DRs. That is, in case of two DRs, the signing space is divided into two contrastive areas. We further assume that the first DR (i.e. the referent mentioned first in the examples used in our experimental study) is assigned by default to the ipsilateral area of the signing space (which is assumed to be the right side for right-handed signers). By contrast, the second DR (i.e. the second mentioned referent in our examples) is assigned to the contralateral area of the signing space.

The present study: We conducted a classical ERP study based on Kutas & Hillyard, (1980) to elicit an N400 component by manipulating the sentence–final predicate to either fulfill or violate the semantic expectation created in the two-sentence context (cf. Hosemann et al. 2013, Hänel-Faulhaber et al. 2014 for comparable studies on DGS). Hence, we used a mismatch-design and constructed sentence sets (see example 1) containing two DRs without any overt localization in the first sentence and a pronoun (INDEX) at the beginning of the second sentence followed by a predicate clearly identifying one of the two DRs. According to our expectations, example (1ad) should be felicitous sentence sets because MAN is linked by default either to the right (1a) or left (1d) area of the signing space and the anaphoric relation established by the pronominal pointing signs INDEX$_R$ in (1a) and INDEX$_L$ in (1d) does not violate the semantic expectation, henceforth match condition. By contrast, the examples in (1bc) should not be felicitous since the anaphoric relation creates a mismatch (henceforth 'mismatch condition'). In (1b) for example, the pronoun INDEX$_L$ establishes an anaphoric link to the second referent WOMAN but the following predicate is only acceptable with the first referent MAN. Thus, the two groups of conditions are expected to show

different effects on the sentence-final nominal predicate BEARD in the second sentence ('R' stands for right and 'L' for left).

(1) a.   MAN   WOMAN   FLIRT.   INDEX$_R$ HAVE   BEARD.

   b.   MAN   WOMAN   FLIRT.   INDEX$_L$ HAVE   BEARD.

      'A man flirts with a woman. She/he has a beard.'

   c.   WOMAN MAN   FLIRT.   INDEX$_R$ HAVE   BEARD.

   d.   WOMAN MAN   FLIRT.   INDEX$_L$ HAVE   BEARD.

      'A woman flirts with a man. She/he has a beard.'

160 stimuli (40 for each condition) were video-recorded with two right-handed professional deaf signers of DGS, digitized, and then presented to the participants at the rate of natural signing. The stimuli were controlled for non-manuals, verb types and the semantic relation the sentence-final predicate establishes. Given that even the transition phase between two signs can already provide sufficient information about the next sign to evoke neurophysiological correlates (Hosemann et al., 2013), three different points in time (including the time window before sign onset) of the predicate (henceforth 'description part') were manually coded for the later analysis. In total 21 right-handed deaf native signers of DGS (12 female, 9 male, age range: 20-51 years) participated in this study. The participants were acquired from different regions of Germany, had at least high school education level, and learned DGS before the age of three. We recorded ERPs while participants watched the pre-recorded videos and judged the presented sentence sets according to their well-formedness. Additional tests were conducted to check the understanding of the signs used in the stimuli.

Results: For the analysis we compared the match and mismatch conditions. The data show a difference on the description in the second sentence between 500 and 600 milliseconds over central and centro-parietal regions on the left hemisphere. This is in line with our hypothesis that signers of DGS use default strategies for assigning DRs to R-loci if the DRs are not linked to R-loci overtly. Additionally, the data show that in case of two DRs, they are assigned to the contrastive areas in the signing space. This study is the first attempt to investigate the processing of DRs and anaphora resolution in DGS experimentally and thus adds a new picture to our understanding of discourse processing in sign languages in particular and natural languages in general.

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SYNTACTIC DIFFICULTIES OF CHILDREN WITH HEARING IMPAIRMENT: THE CRITICAL ROLE OF THE CRITICAL PERIOD FOR SYNTAX

Naama Friedmann (Language and Brain Lab, Tel Aviv University, Israel)

Reduced language input during the sensitive period for language acquisition can seriously affect the development of syntax. The talk will describe the syntactic difficulties of orally trained children with hearing impairment in the comprehension and production of sentences derived by Wh movement.

We used tasks that tested comprehension, production, and repetition of sentences derived by Wh movement: relative clauses, object questions, and topicalization structures and compared these with sentences with embedding without WH-movement, sentences with other types of syntactic movement (V-C movement and A-movement), and to other types of dependencies (pronoun dependency). Comprehension was tested using a sentence-picture matching task, a paraphrasing task and a question-about a sentences task, production was tested using a preference elicitation task and a picture description task. Sentence repetition used delayed repetition of sentences of various structures to further explore their syntactic abilities in various structures. We also tested their ability to read aloud and understand texts with and without syntactic movement.

The participants were 77 individuals with hearing impairment: 53 Hebrew-speaking children with moderate to profound hearing loss from birth aged 9;4-12;3 years (M = 10;4, SD = 0;9), 25 using cochlear implant and 28 using two hearing aids, and 24 Palestinian Arabic-speaking individuals with hearing impairment aged 9;6–21;0 (M = 14;6, SD = 2;1); 15 used binaural hearing aids; 2 used a cochlear implant; and 4 preferred not to use any type of hearing device. Hearing children with typically-developing language in fourth grade participated as controls.

The results indicated that most of the orally-trained children with hearing impairment showed deficit in object Wh-movement, with good ability to construct sentences with embedding without movement. The individual-level analysis indicates that a few of the children show a more extensive deficit that applied also to embedding without movement, which suggests that for them, the construction of the syntactic tree is impaired. Even children with good reading at the single word level failed to read (and understand) texts with syntactic movement when they had a syntactic deficit.

Age of hearing device fitting was the only background factor that correlated with syntactic abilities: children with hearing impairment who received hearing devices during the first year of life had better syntax. Thus, the first year of life forms a critical period for the acquisition of syntax, limited input in this period causes syntactic impairment.

ABSTRACTS

POSTERS

Classifications of Modal-like Expressions in Japanese Sign Language: A Preliminary Study to Investigate the Cartography of the Right Periphery

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Background: Modal-like expressions in Japanese have been analyzed mostly from a semantic or functional point of view (Masuoka 1991, Nitta 1991, Sawada 2006, etc.) In recent studies, however, researchers have considered formal properties of those expressions in the generative framework (Inoue 2007, Ueda, 2007, Saito 2015). By using syntactic tests discussed in those studies, expressions which indicate the speaker's state of mind (equivalent to epistemic modals) in Japanese can be classified into "True" modals (e.g. daroo 'would', mai 'won't') and "Quasi" modals (e.g. chigainai 'must, without doubt', yoo da 'seem'). True modals cannot be followed by negation or tense expression. In addition, they obey the uniqueness condition (Ueda 2007, Saito 2015); there is only one True modal allowed in a clause. On the contrary, Quasi modals can be followed by negation/tense morphemes, and more than one Quasi modal may be included in a clause. A True modal may follow a Quasi modal, but not vice versa. Inoue (2007) argues that the True modal is an inflectional affix, while the Quasi modal is a type of predicate (V), which takes IP (TP) as its complement.

Purpose: The purpose of the current study is to consider the properties of modal-like expressions in Japanese Sign Language (JSL), and to establish empirical facts to investigate the cartography of the JSL right periphery. JSL native signers, with informal training in sign language linguistics, were asked to identify modal-like expressions which describe the signer's state of mind (certainty, evidentiality, etc.) Ten modal-like expressions were collected and analyzed with the syntactic tests mentioned above. Since tense markers are not available in this language, we used the tests with negation (with the manual Neg marker NAI 'not') and restrictions on the ordering of multiple modal-like expressions.

Results: The results of our syntactic tests revealed that JSL modal-like expressions can be classified into three types, as shown below. True modals are classified into 'High' and 'Low', according to the ordering restriction (the High must follow Low). Unlike their Japanese counterparts, no more than one Quasi modal may be used in a clause. Either of the True modals can follow a Quasi, but the reversed order is not possible.

| Modal type	negation test	ordering restrictions
True-High (*TRUE, WRONG, DON'T-KNOW*)	cannot be negated	may not be followed by any modal-like expressions
True-Low	cannot be negated.	may be followed only by the True-

(*MEAN, ERROR, SEEM*)		High modals
Quasi (*DECIDE, SHOULD,* *PLAN, IMAGINE*)	can be negated	may be followed by any True modals; may not be followed by other Quasi modals (uniqueness)

We also collected the example sentences with the perfect aspectual marker (mouth gesture "PA"). The aspectual marker typically appears with a verb. When the verb is followed by quasi and true modals, however, the month gesture may only appear with the quasi modal.

$$*\underline{\quad}PA \underline{\quad}PA *\underline{\quad}PA$$

(1)   MAN COME DECIDE MEAN' It's that the man certainly has shown up.'

Based on the above-mentioned observations, we propose the following structure with JSL functional heads. We will leave open the issue of the position of the (invisible) tense.

(2)
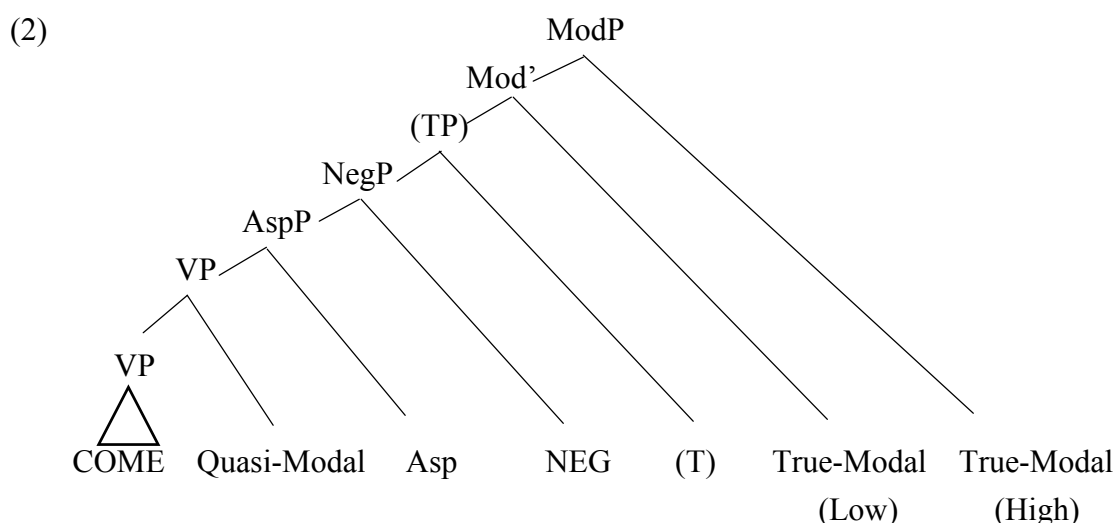
Summary of the findings: In this study, we demonstrated that Quasi and True modals can be identified with the syntactic tests developed in previous studies. True/Quasi modals in JSL are different from their Japanese counterparts in the following ways: (a) True modals do not follow the uniqueness condition and need to be classified into two types based on their ordering patterns, and (b) Quasi-modals follow the uniqueness condition.

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DISCOURSE FUNCTIONS OF PALM-UP IN GERMAN SIGN LANGUAGE (DGS)

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Background: It has been shown for several sign languages, that *palm-up*, also used as a co-speech gesture in spoken languages (cf. Kendon 2004), may fulfill various functions within sign language discourse (cf. Engberg-Pedersen 2002; Conlin, Hagstrom, and Neidle 2003; McKee and Wallingford 2011; van Loon 2012). *Palm-up* is produced either one or two-handed with a lax 5-handshape. Starting from a downward or inward palm orientation, the hands turn to an upward orientation. With the observation that the use of *palm-up* appears to be age sensitive (cf. McKee and Wallingford 2011; van Loon 2012), van Loon, Pfau, and Steinbach (2014) further argue for a grammaticalization path from gesture to functional linguistic element. Accordingly, *palm-up* enters the grammatical system of sign languages as a turn-taking marker, which may further develop more grammatical meanings paving the way for discourse markers, conjunctions, and epistemic markers, among others. Following this line of argumentation, I will present the first results of a thorough investigation of *palm-up* in German Sign Language (DGS), which evaluates its discourse functions in relation to different age groups.

Method: This study draws on video data collected from 19 native and one near-native deaf DGS signers. The signers were divided into three different age groups: group A (17-29 years) included seven participants, group B (33-52 years) six participants, and group C (57-84 years) seven participants. Each data session involved two signers and was conducted by a deaf native signer. The task comprised five questions for discussion on controversial issues, e.g. 'Should pupils wear school uniforms?'. The interviewer directed each question to the participants and asked them to discuss pro and contra arguments. The resulting discussions range from 7 to 21 minutes adding up to a total of 134:05 minutes. Out of each discussion, I selected a sequence between 5 and 7 minutes without interruption of the interviewer and annotated it with ELAN. So far, the data of eight signers is evaluated and analyzed including four participants of group A (17-23 years; two men and two women) and four participants of group C (57-73 years; two men and two women).

Results: The analyzed data comprises a total of 24:10 minutes of free interaction, which includes 347 tokens of *palm-up*. These tokens fall into four established discourse categories corresponding to the results of van Loon (2012) on Sign Language of the Netherlands (NGT) and McKee and Wallingford (2011) on New Zealand Sign Language (NZSL): (i) discourse regulation, (ii) coherence, (iii) modality, and (iv) framing. The category of discourse regulation includes signals to open, end, and pass a turn, hold the floor, mark hesitation, provide a backchannel signal, and to mark the end of a question. Coherence may be achieved by utilizing *palm-up* as a conjunction or as an elaborative marker. Modality is expressed in terms of epistemic and evaluative stance. Finally, *palm-up* may serve as a frame for mouthed words or affective facial expressions.

With 52,15% for group A and 61,41% for group B, both groups of signers use *palm-up* predominantly to perform discourse regulation. Within this category, the use of backchannel signals appears most frequently in both groups (34,12%/40,71%). As for the older signers, this is followed by hesitation markers with 21,24% within this category. The younger signers, however, choose more often to open a turn with *palm-up* (24,71%), which is sometimes accompanied by mouthing the German word *aber* ('but'). In general, younger participants utilize *palm-up* most frequently to express modality in terms of epistemic stance (26,99% of all tokens of group A), i.e. indicating the degree of commitment towards the truth of the utterance (cf. (1); *palm-up* is glossed as 'g-pu'). In these cases, *palm-up* is articulated sentence finally and is marked nonmanually by movements of the upper body, the head, the lips, and/or the corners of the mouth forming a prosodic unit with the previous utterance. Apart from that, the younger signers are able to reduce the number of *palm-up* gestures by extensive use of alternative signs, e.g. CORRECT, YES, and CLEAR as backchannel signals and the finger wiggling gesture *g-wiggle* as a hesitation marker. Interestingly, they also use the signs CORRECT and YES at the end of a sentence (2), which in turn may indicate epistemic stance.

(1)   BUT TRUE PAY PAM HAVE g-pu

        'But I am not sure if they are paid fairly.'

(2)   GRADE ABOLISH FOR-THAT g-wiggle DESCRIPTION : MORE WORK YES : …

        'School grades should be abolished and substituted by uhm descriptions, which is of

        course more effort, …'

The group of older signers remarkably often utilize *palm-up* as a frame for affective facial expressions (21,44% of all tokens of group C). Affective facial expressions are composed of several nonmanual features, which holistically convey the attitude of the signer. In this way, they most often serve as a comment on the previous utterance. As can be seen in (3), a pointing gesture directed to the signer ('IX-1') may be added, which further emphasizes that the affective facial expression is added as a subsequent comment indicating the attitude of the signer. In contrast, younger signers express their attitude as shown in (4). Hence, the sentence contains a lexical item representing the attitude, which may be complemented by a sentence final *palm-up*. These cases of *palm-up* are typically accompanied by head nod, head shake or shrugged shoulders. As they are directly connected to the sentence both semantically and prosodically, they are analyzed as evaluative stance markers.

(3)   OPEN 24 HOURS MUST : IX-1 g-pu

        'I don't care if they (the supermarkets) should be open 24 hours.'

(4)   IX-1 ALSO LITTLE SKEPTICAL 24 HOURS g-pu

        'I am also a little skeptical concerning (supermarkets being open) 24 hours.'

Conclusions: The evaluation of the data reveals three main results regarding discourse functions of *palm-up* in DGS. First, *palm-up* is used predominantly for discourse regulation across ages. Second, younger signers decrease the ambiguity of the multifunctional gesture *palm-up* by replacing it with

alternative signs realizing specific discourse functions. Finally, older signers make frequent use of *palm-up* as a frame for affective facial expressions, which may serve as a source for marking modality in terms of epistemic and evaluative stance.

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SIMULTANEOUS AND SEQUENTIAL COMPOUNDS IN LIS: PRELIMINARY RESULTS FROM A PERCEPTUAL EXPERIMENT

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Background. Although theoretically possible, full simultaneous compounds are quite rare in sign language (i.e. when dominant and non-dominant hand simultaneously articulate one member of the compound each. See Brennan 1990 for some example in BSL). However with some form of phonological reduction, classifier signs may combine with other signs to generate simultaneous/affix-like compounds (Meir et al. 2010). Indeed phonological reduction is one of the tests originally proposed to identify simultaneous compounds in sign language (Klima and Bellugi 1979). In morphological theories, like Distributed Morphology, the status of compounds is unclear, while some authors include root-root compounds as a parametrically governed grammatical option (e.g. Snyder 2001), others allow compounding only after the category label has been assigned (e.g. Harley 2009).

Goals. i) Experimentally investigate perceptual similarities and differences between phonologically reduced simultaneous and sequential compounds in LIS; ii) Establish whether phonological reduction is a good test to identify compounds in LIS; iii) Evaluate whether a single or two derivations are needed to account for simultaneous or sequential compounds.

Hypothesis. If phonologically reduced simultaneous and sequential compounds are equally perceived as a single word-like unit (as the English *swordfish* is normally perceived as a single word unit), they may receive a similar morphosyntactic derivation. If there is a difference in perception (e.g. sequential compounds perceived as two separate signs more often than simultaneous compounds), then this difference can be taken as potential evidence for a two independent morphosyntactic derivation.

Methodology. *Stimuli*. We selected 12 sequential and 12 simultaneous LIS compounds, all phonologically reduced. For each compound we created a minimal triplet of simple declarative sentences with a target item and two baselines. The first baseline matches the number of signs as if the compounds were computed as a single word, the second baseline matches the number of signs as if the compounds were were computed as two words. Sentences may vary in length (3+1-6+1 signs each) for a total of 72 stimuli. A triplet for sequential compounds is given in (1); a triplet for simultaneous compounds is given in (2):

1. a. YESTERDAY ANNA HEART^EXPLODE
   b. YESTERDAY ANNA WORK (baseline-1 for HEART^EXPLODE = 1 word)
   c. YESTERDAY ANNA NAUSEA VOMIT (baseline-2 for HEART^EXPLODE = 2 words)
       'Yesterday, Anna (a.)got an heart-attack/(b.)worked/(c.)got nausea and vomit.'

2. a. PAOLO CL-ZIP^CL-CILINDER BLACK

    b. PAOLO SHIRT BLACK (baseline-1 for CL-ZIP^CL-CILINDER = 1 word)

    c. PAOLO SOCKS SHOES BLACK (baseline-2 for CL-ZIP^CL-CILINDER = 2 words)

    'Paolo has a (a.)black pencil-case/(b). black shirt/(c.)black socks and shoes.'

Design. Subjects watch the video of each sentence on a computer screen and right after that they have to introduce on the keyboard the number of signs of the sentence they just saw. Each video is played only once. Stimuli of various length appeared at a random order. To make sure that subjects pay attention to the content of the videos, 15 comprehension questions appeared after the relevant stimuli. For instance the comprehension question for the sentence (2b) is 'what color was Paolo's shirt?'. Only results from subjects that have an accuracy above 60% on the comprehension task are considered for the analysis. At the end of the experiment subjects have to fill in a small questionnaire to collect meta data. Instructions are provided in a video created by a native signer of LIS. We used the Qualtrics platform to administer the experiment.

Participants. Nine Deaf subjects have been recruited for a pilot study. By conference time the number of subjects will be increased up to 25-30 subjects.

Answer coding. Answers have been coded as *match* or *mismatch* depending on whether the number provided by the subjects matched or not the number of signs in the stimulus. Answers for target stimuli are treated as *match* if the compound is counted as a single word. To illustrate, answering "3" after viewing the stimulus in (1a) would count as a *match*, while answering "4" (or any other number) would count as a *mismatch*.

Results. Accuracy on the attention questions was above 60% for all subjects. Accuracy on the experimental stimuli was quite high (70% match). A mixed model logistic regression with subject and item as random factors revealed a significant effect of *stimulus type* (sequential compound, simultaneous compound, baseline 1 or baseline 2) and *stimulus length* (3-4-5-6-7 word per sentence). The plot of the results is given in figure 1. As for *stimulus type*, simultaneous compounds have the same accuracy of baseline-1, while sequential compounds are significantly worse than simultaneous ones (but still above chance, 58%). As for *stimulus length* the longer the stimulus the lower the accuracy (68% in the case of 7-word sentences). No interaction was found.

Discussion. The effect of stimulus length is quite expected and can be explained in terms of processing costs due to high involvement of working-memory (counting the signs and computing the meaning). The effect of stimulus type was a bit surprising. We take the fact that simultaneous compounds are indistinguishable from baseline-1 to indicate that they are fully integrated in the lexicon as one-word signs both at the phonological and morphological level, while sequential compounds have their category labels still visible in the morphosyntax. Within Derivational Morphology, we propose to account for the contrast in the following way: Phonologically reduced simultaneous compounds are derived by syntactic merge of two classifier roots prior category labeling (hence they are one single morphological word, cf. 3a). Phonologically reduced sequential compounds are derived by incorporation of a root into the other root after category labeling has already applied (cf. 3b).

3. a. CL-ZIP^CL-CILINDER = [$_{nP}$ [$_√$ CL-ZIP] [$_√$ CL-CILINDER]]

    b. HEART^EXPLODE = [$_{n2P}$ [[$_{√P}$ [$_{n2}$ [$_√$ HEART]] [$_√$ EXPLODE]]∅] t [$_{√P}$ $_{[n1}$ [$_√$ HEART]] [$_√$ EXPLODE]] [$_{n1P}$

    t$_{[n1}$ [$_√$ HEART]]]]

Conclusions and extensions. The fact that overall accuracy was high both with simultaneous and sequential compounds indicates that phonological reduction is a good test to detect compounds in LIS. Still, there is a perceptual difference between simultaneous and sequential compounds. We attribute this difference to the fact that the two kinds of compounds are derived in a different way.

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CONDITIONAL CLAUSES IN DGS AND LIBRAS - A SYSTEMATIC COMPARISON

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Research Question: German Sign Language (DGS) and Brazilian Sign Language (LIBRAS) are two unrelated languages with very different historical backgrounds. DGS is an autochthonously arisen sign language with a lot of regional varieties. This is due to the establishment of several independent Deaf Schools in Germany (about 90 schools until 1900) and a predominantly strong oralist tradition. By contrast, LIBRAS emerged in a single Deaf School called *Instituto Nacional de Educação dos Surdos* in Rio de Janeiro combining home sign systems and French Sign Language (LSF). The school was founded in 1857 and has continuously hired Deaf teachers. Thus, LIBRAS exhibits very little dialectal variation.

In the present study, I am investigating the structure of conditional clauses in both languages. Usually, conditional clauses are only briefly mentioned in existing sign language grammar books and have not been systematically investigated, analyzed and documented for DGS and LIBRAS so far. The main question regarding a formal description is which manual and nonmanual markers are common to both languages and which are specific. Furthermore, I will describe and discuss alternative linguistic strategies that may be used, and also take into account the influence of language contact with the surrounding spoken languages German and Portuguese.

Conditional clauses: In DGS, there are three predominant strategies to express conditionals: (a) a sign initiating the antecedent that is borrowed from the phonetic manual system, WENN1, (b) an arbitrary sign, WENN2, and (c) nonmanual markers only. To express the consequence in DGS, there is an optional manual sign, DANN ('then'). Contradictory to former descriptions in the literature, the order between the antecedent and the consequence is fixed: The antecedent always precedes the consequence (Happ & Vorköper 2006). LIBRAS uses two possible markings: (a) either a fingerspelled sign ('SI') on the antecedent or (b) nonmanual markers only. Also, the inversion of antecedent and consequence seems to be a possible syntactic variation. In general, nonmanual markers described to accompany the antecedent in other sign languages, such as Israeli Sign Language (ISL) and American Sign Language (ASL), are raised eyebrows (rb), head nod or tilt (hn or ht) (cf. Dachkovsky 2008). For the consequence, researchers often note some contrastive markers such as backward movements of the brows, head and/or body (cf. Bellugi 1983). This can also been observed in DGS and LIBRAS.

Methodology: In order to elicit a high amount of conditional clauses, I used a specific card game called *Cheese Race Game* as elicitation material (cf. Dachkovsky dissertation). In this game, the rules allow the players to play certain mouse- cheese- or cat-cards only if a particular card has been played before. Hence, explaining these rules inevitably elicits several conditional clauses. The task of the Deaf informant was to explain the rules to another novice Deaf participant, who then explains

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the rules to a further novice Deaf participant, and so on. The explanations of each participant have been recorded and the data are annotated and evaluated with ELAN. The relevant categories for conditional clauses are the respective manual and nonmanual markers as well as clause structure and alternative strategies. I will provide a comparative classification and frequency distribution of the variable ways of marking conditional clauses at the lexical, syntactic, and prosodic level. Furthermore, I investigated three different age groups within each sign language and compared the results to each other (18-35 y, 36-50 y, 51-90 y).

First observations: So far, my annotated data demonstrate the following results. For both sign languages, I observed a strong influence of the language contact DGS-German and LIBRAS-Portuguese: The sign language conditional clauses often have the same syntactic structure as the basic spoken language conditional clauses. The manual signs that introduce the antecedent – WENN1 in DGS and SI in LIBRAS – are de facto former fingerspelled forms of their surrounding written language ('wenn' in German and 'se' in Portuguese). The rare occurrence of an inversion of this subordination seems to be possible in DGS as well as in LIBRAS. This flexible order of both clause parts might be an influence of spoken or written German and Portuguese, in which this is more common (cf. (1)).

Furthermore, I observed a manual marker DANN ('then') for the consequence in DGS. LIBRAS has officially been noted not to employ a manual marker for the consequence. Surprisingly, however, signers in both sign languages make use of various manual markers for the consequence, which were not previously described in conditional constructions of those languages. For example, the DGS sign BEDEUT ('mean') and the LIBRAS sign SIGNIFICAR ('mean'), which are semantically very similar were used for the consequence in the data (cf. (2)). In DGS, the manual markers dominate the data while nonmanuals are rarely used to mark conditionals alone. In LIBRAS, the use of nonmanual marking only is comparatively more prominent and also shows a higher variety amongst them. An interesting additional finding is, that the change of hands to express the subordination is possible (cf. (3)).

With regard to age groups, older Deaf signers tend to explain the rules of the *Cheese Race Game* by using interrogative clauses and declaratives (question answer style) rather than through conditionals. By contrast, younger Deaf signers (in both languages) frequently explain it with the more elaborate structure of conditionals.

Examples:

(1)   '*With the cheese, you get the card stack, if it's the cat, then I get it.*'

<div align="center">

——————— hn ———— rb, ht-d ———————————— bl-b ————

THROUGH CHEESE GET-2 IF₁ CAT IX₁ GET-CL:THE CARD STACK   (DGS)

</div>

(2)   a. '*If I put a cat card as last card, this means, I get the card stack.*'

<div align="center">

———————————————— rb, ht-d ————

</div>

<div align="center">

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</div>

$$\overline{\hspace{5.5cm}}^{\text{sq}}$$

$$\overline{\hspace{3cm}}^{\text{bl-f}} \quad \overline{\hspace{2.5cm}}^{\text{bl-b}}$$

IF1 IX$_1$ LAST CARD PUT-$_{\text{CL:PLAYING CARD}}$ CAT MEAN IX$_1$ GET-$_{\text{CL:THE CARD STACK}}$ (DGS)

b. '*If I put a card (with three paws), this means that (you) shoot three times.*'

$$\overline{\hspace{1.5cm}}^{\text{rb, w}} \quad \overline{\hspace{3cm}}^{\text{ht-u}}$$

$$\overline{\hspace{1.5cm}}^{\text{bl-b}}$$

IF IX$_1$ PUT-$_{\text{CL:PLAYING CARD}}$ MEAN SAME SHOOT THREE-TIMES   (LIBRAS)

(3)   '*If there are three (paws), then you have to put down (cards) three times.*'

$$\overline{\hspace{0.8cm}}^{\text{rb, ht-r}} \quad \overline{\hspace{1.5cm}}^{\text{ht-l}}$$

LH: IX$_{\text{DEM}}$ THREE   ONE TWO THREE

RH: MUST PUT-$_{\text{CL:PLAYING CARD}}$++   (LIBRAS)

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M1L2 SIGNERS: ACCENT AND LINGUISTIC CHARACTERISTICS OF DEAF BILINGUAL SIGNERS

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Currently, there is little conclusive evidence as to what characterizes accented sign language or how accents are perceived in sign languages. In this study, information was gathered on the perceptions of proficient signers while viewing videos of Deaf bilingual signers (unimodal bilinguals) producing language in their L1 and L2 sign languages. The data were analyzed for what features contribute to the perception of accent, how strong of an accent each signer was perceived as having, the different impact of different L1 languages, and the characteristics of transfer between the L1 and L2 production. Sign languages examined include Persian Sign Language, Swedish Sign Language, Japanese Sign Language, American Sign Language and Langue des Signes Québécoise. I find that accent ratings vary significantly across individuals, but several interesting trends emerge. Initial analysis shows that there was a significant difference in Deaf (N= 37) and hearing participants (N = 36) on accent ratings (t = -2.21, p = 0.03). There was also a significant difference in accent ratings based on age of language acquisition (comparing native and nonnative signers) (t = -2.836, p = 0.009). Both Deaf and native signers tended to rate the sign models as more highly accented. Across all respondents, there was consensus in terms of which factors contribute to the perception of accent. In general, the qualitative responses and the factor ranking indicate that mouthing is a highly salient cue for judging a signer to be accented or not. My results also show that accent in sign language appears to be more influenced by prosodic features than segmental features. The mouthing and prosodic features of each bilingual signer are examined for instances of transfer and non-native-like production.

THE UNDERESTIMATED POWER OF TRANSITIONAL MOVEMENTS WITHIN SYNTACTIC PROCESSING IN AUSTRIAN SIGN LANGUAGE (ÖGS)

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Transitional movements between signs have been mostly interpreted as phonetic trajectories not worthy of linguistic analysis. Which parts within a signing stream are considered as transitional movements (vs. linguistic movements) is closely related to the definition of sign on- and offset. So far, sign onset has been mostly defined by phonological models as the „first hold" of a sign (according to the Hold-Movement-Hold model of Liddell & Johnson 1989). However, the „holds" of signs seem not to be an appropriate phonological cue for defining sign onset and are better described as phonetic (see e.g. Wilbur 1990). Therefore, some (combination of) phonological information should be established for determining sign onset and, related to this, when lexical access takes place. At least for isolated signs of American Sign Language (ASL) Emmorey & Corina (1990) showed by a gating study that signs were recognized after the hand configuration and location were established and the movement started. Other studies, however, showed that even transitions towards the „first hold" of signs provide a considerable amount of information with regard to sign recognition at both the sign and sentence-level (Ten Holt et al. 2009, Jantunen 2010).

The present gating study, which follows up on a previous ERP-study, revealed the impact of transitions on the processing of locally ambiguous argument structures in Austrian Sign Language (ÖGS). Studies on different spoken languages showed that locally ambiguous argument structures are preferentially interpreted as SOV-orders, such that ambiguous object-initial sentences have to be reanalyzed (the „subject preference"). This reanalysis causes increased processing costs for OSV vs. SOV which are reflected in e.g. longer reaction times, lower acceptability ratings or different ERP-effects (e.g. Bornkessel-Schlesewsky et al. 2008). In a previous ERP-study on ÖGS we presented signed SOV- vs. OSV-sentences involving either agreeing verbs (1) or plain verbs accompanied by one of two agreement markers (2). This ERP-study revealed a „subject preference" in ÖGS reflected by longer reaction times, lower acceptability ratings, and an ERP-effect bound to the time point when both arguments were referenced in space and/or the transitional movement towards the verb sign/agreement marker started (i.e. before the verb sign) for OSV compared to SOV. This relatively early ERP-effect (as compared to subject/object ambiguities in spoken languages) contradicts assumptions within theoretical sign language linguistics which propose that the path movement and/or facing of the agreeing verb/agreement marker indicates the argument structure (e.g. as far back as Friedman 1976).

To investigate the question of when disambiguation takes place and which visual cue(s) may resolve ambiguity, we conducted a gating study. We presented a set of sentences from the ERP-

study stimuli 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 point 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 is the active one - most likely to be the subject.

Data analysis revealed that in most of the items the first significant difference between mean ratings for SOV- and OSV-orders occurred after the gate in which both arguments were located in space and the hand which produces the verb/agreement marker started transitional movement towards the verb/agreement marker. Further, before this time point of disambiguation most sentences were rated as SOV-order. Therefore, the present gating study supports the claim of a „subject preference" in ÖGS.

This study provides the first evidence for the relevance of transitions within the processing of locally ambiguous argument structures in ÖGS. Further, the present findings point to the fact that signers and speakers draw on similar strategies during language processing independent of language modality. However, whether modality has an impact on the time course of processing in that disambiguation takes place earlier in ÖGS compared to spoken languages depends on how sign onset is defined. The results clearly show that information about the argument structure is available in most cases prior to the time point which has usually been considered as sign onset. This observation leads to the question of when a sign within a signed sentence starts and when it ends. Hence, whether the information leading to disambiguation is linguistically (transitions as part of lexical signs) or non-linguistically determined (transitions as phonetic trajectories) has important implications for the interpretation of results of studies on (the time course of) sign language processing.

Examples: Signs are glossed with capital letters; IX= manual index sign; AgrM= agreement marker; Subscripts ($_{3a, 3b}$) indicate reference points within signing space

(1) GRANDCHILD$_{3b}$ IX$_{3b}$ GRANDMOTHER$_{3a}$ IX$_{3a}$ $_{3b}$VISIT$_{3a}$ (SOV) / $_{3a}$VISIT$_{3b}$ (OSV)
   The grandchild visits the grandmother.

(2) GIRL$_{3b}$ IX$_{3b}$ WOMAN$_{3a}$ IX$_{3a}$ $_{3b}$AgrM$_{3a}$ KNOW (SOV) / $_{3a}$AgrM$_{3b}$ KNOW (OSV)
   The girl knows the woman.

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THE SYNTAX OF FINITENESS IN ÍTM

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One of the most striking properties of sign languages across the world is the absence of morphological tense marking. However, since abstract syntactic features need not have overt morphological manifestation, the absence of tense inflections does not entail the absence of a finite T(ense) head. Indeed, finiteness has been argued to play a role in the syntax of a spoken language with no tense inflections like Chinese (Tang 2000, Lin 2011) and sign languages like ASL (Petronio 1993) and LIS (Geraci et al. 2008).

We will argue here that Icelandic Sign Language (ÍTM) has a finite T-head even though ÍTM lacks tense morphology like other sign languages. To support our claim we will mostly focus on *BIDD*, a recently grammaticalized copular verb in ÍTM:

(1)   PRO-1 (BIDD) HUNGRY   'I am hungry'

Note that (1) is glossed as present tense, but *BIDD* is also compatible with past or future tense interpretations. On the other hand, the use of *BIDD* is clearly subject to some pragmatic restrictions but they are currently not well understood.

Since *BIDD* was grammaticalized from an anaphoric pronoun in subject position (Spec,TP), we assume that *BIDD* is base-generated in T, exemplifying spec-to-head grammaticalization (Gelderen 2011:128-142). As an element of a head-initial T, *BIDD* cannot follow its complement, as shown in (2b). By contrast, main verbs can follow their complements inside VP (for some speakers), as in (2a). (Modals seem to behave like *BIDD* in this respect but this requires further investigation.)

(2a)   PRO-1 BISCUIT EAT   'I eat biscuits'

(2b)   *PRO-1 HUNGRY BIDD   'I am hungry'

Due to its syntactic position, *BIDD* is expected to precede sentence-medial adverbs of all kinds. Although we have fairly limited data on this issue, it is clear that such adverbs precede lexical verbs (since they do not raise to T), as in (3a), but they usually follow *BIDD*, as in (3b):

(3a)   UNIVERSITY TEACHER ALWAYS USE SLIDE

       'University teachers always use slides'

(3b)   B-Á-R-A (BIDD) NOW UNRESPONSIVE

       'Bára is unresponsive now'

The strongest argument that *BIDD* lexicalizes finite T is that *BIDD* is only possible in finite contexts. It is e.g. not possible in the complement of a modal, as shown in (4). By contrast, *BIDD* is possible in finite embebbded clauses, as in (5):

(4)   PRO-1 WANT (*BIDD) SMART TONIGHT

       'I want to look good tonight'

(5)   TRY EXPLAIN PRO-3 (BIDD) DEAF

       'He tried to explain that he was deaf'

We assume that verbs like *WANT* in ÍTM select infinitival complements, i.e. clauses with an obligatorily null subject that is referentially dependent on a matrix argument. Thus, our claim is that the syntactic distribution of *BIDD* is very similar to the distribution of English modals (*can*, *must*, *may* etc.) and lexical tense markers in ASL (Aarons et al. 1995).

It is well-known that infinitival complements in spoken languages may display various transparency effects in contrast to finite complements. This is exemplified by syntactic phenomena like clitic climbing, raising, long-distance anaphora and extraction. This remains to be investigated for ÍTM but there is at least one phenomena which we know of that shows a clear distinction between finite and non-finite clauses. As illustrated in (6a), negative non-manuals in ÍTM can spread into the complement of the negative aspectual predicate NOT-DONE. We take this complement to be non-finite because the embedded subject must be null and coreferential with the matrix subject. In contrast to (6a), spreading negative non-manuals into finite complements is excluded, as shown in (6c):

$$\overline{\hspace{6cm}}$$

(6a)   WOMAN NOT-DONE BUY YELLOW FLOWER

       'The woman has not bought yellow flowers'

$$\overline{\hspace{3cm}}$$

(6b)   MAN NOT-DONE ASK IF PRO-1 OWN CAR

       'The man has not asked if I had a car'

$$\overline{\hspace{6cm}}$$

(6c)   *MAN NOT-DONE ASK IF PRO-1 OWN CAR

       'The man has not asked if I had a car'

Although there is a lot of variation in the spreading of negative non-manuals in ÍTM, it is clear from all the data we have gathered that examples like (6c) are impossible. The negative non-manuals must stop at the finite clause boundary, as in (6b).

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WEAK DROP IN SHANGAI SIGN LANGUAGE

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Weak drop refers to the phenomenon in which the other hand in two-handed signs is optionally deleted in articulation. The study aims at investigating this phonological process both in isolated forms and in the context of connected discourse based on data from Shanghai Sign Language (henceforth SSL), the representative southern variety of Chinese Sign Language (CSL).

For weak drop in isolated forms, a vocabulary list of 459 two-handed lexicalized signs (287 balanced signs and 172 unbalanced signs) in SSL was presented to 3 Deaf signers and asked about the grammaticality of the one-handed forms. The one-handed version which was accepted by two or more signers was taken as a well-formed form, thus allowing weak drop for that particular sign. It is discovered that a bunch of phonological, semantic, morphological and iconic factors are playing a role in facilitating or inhibiting weak drop. The following generalizations can be made from SSL:

Phonological features in weak drop: (1) Symmetry indicates a strong tendency in facilitating weak drop (55%); (2) Alternation is not a strong factor in blocking weak drop (39%); (3) Body contact facilitates weak drop in balanced signs (100%); (4) Continuous hand contact blocks weak drop in symmetrical signs (0%); (5) Crossing blocks weak drop unless body contact is present (27%); (6) 'B' handshape (the unmarked handshape with all the fingers extended) on the weak hand favors weak drop in unbalanced signs (59%)[2].

In addition to the phonological factors that either facilitate (e.g. body contact, symmetry, 'B' handshape) or inhibit (e.g. continuous hand contact, crossing), all the other non-phonological factors are found to disfavor weak drop in SSL:

(1) Semantic factors like ambiguity inhibits weak drop due to the fact that there are a few (near) minimal pairs distinguished by the use of two hands vs. one hand. (2) Morphological complexity (with each hand carrying a meaning) blocks weak drop. (3) Modality effect (iconicity in sign formation) is a pervasive factor in blocking weak drop in all types of two-handed signs in SSL.

For the study of weak drop in context, 33 video clips with a total length of 109 minutes were utilized. The data consists of spontaneous speech and story narration and was taken in the recent two years in three Deaf communities in Shanghai on 13 Deaf signers. The surface forms of the underlying two-handed signs in each subject's natural signing were coded in ELAN. For the moment, the following conclusions have been drawn:

The contrast between one- and two-handed signs is neutralized in contexts like compound and discourse, which results in the undermining of the inhibiting effect of semantic ambiguity found in isolated signs. (2) As an optional process, weak drop is favored between one-handed signs.

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[2] Each percentage indicates the ratio of signs that favor weak drop in respect to the phonological feature in question.

Table 1: Cross-linguistic comparison of weak drop in three sign languages (ASL, SLN, SSL):

	In ASL (Battison 1974; Brentari 1998)	In SLN (van der Kooij 2002)	In SSL
Balanced signs			
-Symmetry	Occurs frequently (percentage not given)	Occurs frequently (90%)	Occurs often (55%)
-Alternation	Does not occur	Occurs often (55%)	Occurs sometimes (39%)
-Crossed	Does not occur	Occurs often (78%)	Occurs sometimes (27%)
-Body contact	No data	No data	Occurs (100%)
-Continuous contact	Does not occur	Occurs	Does not occur
Unbalanced signs			
-if weak hand assumes 'B' handshape	Occurs sometimes (percentage not given)	Occurs often (75%)	Occurs often (59%)

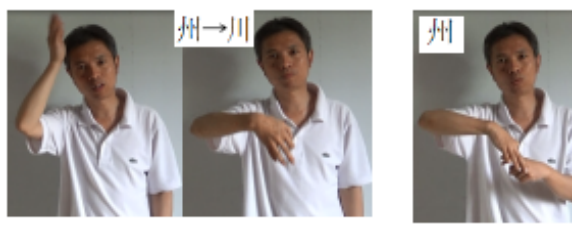**Table 2:** Weak drop in compound and discourse

Figure 1: Underlying two-handed HAPPY surfaces as one-handed in the sentence of PICK-UP HAPPY RUN-HOLD-RABBIT; the contrast between HAPPY and COOK is neutralized, thus undermining the blocking effect of semantic ambiguity in isolated forms.

Figure 2: In the compound HANG^LAND, LAND undergoes weak drop, neutralizing the contrast between the underlying distinct one-handed and two-handed character signs.

Table 3: Realizations of two-handed forms in different phonetic contexts

	Between one-handed	After one-handed, before two-handed	After two-handed, before one-handed	Between two-handed
Total Number	600	871	849	1157
Weak Drop	55	23	19	9
No Weak Drop	545	848	830	1148

Figure 3: Ratio of two-handed signs undergoing weak drop in different phonetic contexts
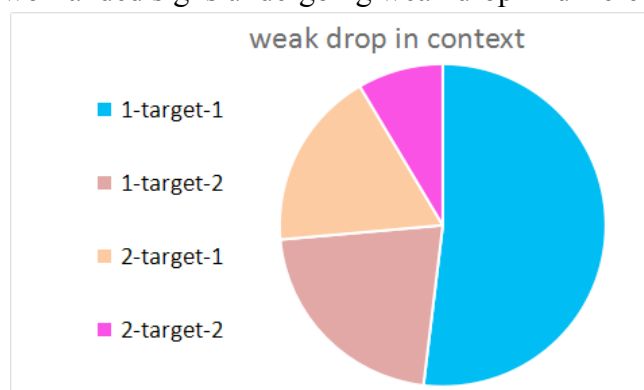
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RELATIONSHIP BETWEEN EXECUTIVE FUNCTION AND SIGN LANGUAGE SKILLS IN SCHOOL-AGED DEAF CHILDREN

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Although it is not fully understood, the developmental relationship between executive function and spoken language skills are reported in studies investigating hearing children (e.g., Müller, Jacques, Brocki, & Zelazo, 2009). Sign language and its correlation with higher cognitive functions of deaf children still need to be explored (Hauser, Lukomski, & Hillman, 2008; Oberg, & Lukomski, 2011). This poster presents a study of linguistic and cognitive functioning of deaf school-aged children to determine the relationship between executive function and sign language skills, as those factors are crucial foundations for learning.

Two groups of deaf children participated in the study: deaf children of Deaf parents without cochlear implant (CI) (N=20, age: M=9.11 years SD=2.00) and deaf children of hearing parents with CI (N=19, age: M=10.8 years SD=1.9). The four components of executive function were analyzed with the following assessment tools: cognitive flexibility-Wisconsin Sorting Task; inhibitory control (interference suppression)-Simon task; inhibitory control (response inhibition)-Go/ no go task; working memory-Corsi block; and planning-Tower of London. The pilot version of the Polish Sign Language (PJM) adaptation of the BSL Receptive Skills Test (RST) was used to determine proficiency in PJM. The non-verbal intelligence was controlled. For the deaf children of Deaf parents, the Pearson correlation coefficient showed a correlation between sign language raw scores and two inhibitory control tasks: Simon task (interference suppression) (r= .61, p< .01) and Go/ no-go task (response inhibition) (r= .46, p< .05). Additionally, there is a positive trend between PJM skills and working memory (Spearman's rank correlation: Rho= .40, p=0,08) in this group. In deaf children of hearing parents with CI, there is a significant correlation between PJM skills (PJM-RST) and working memory (r= .61, p< .01).

The findings of this study suggest that sign language can play role in executive function not only in deaf children of deaf parents who use sign language as first language, but also in deaf children of hearing parents with CI with late and impoverished access to sign language. Two components of higher cognitive functions: inhibitory control (interference suppression and response inhibition) and working memory seem to be related to sign language.

The poster presents first steps in research on executive function in deaf children using Polish Sign Language. In the future, we need to enlarge our sample in order to generalize with more probability the research results on executive function in deaf children.

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IS MOUTHING A CORE COMPONENT OF SIGN LANGUAGES?

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Introduction. Whether mouthing (the co-articulation of a (part of a) word with a sign) is part of the lexical representation of a sign is controversial: some think that mouthing is not a part of the "real" sign language (e.g., Padden 1980) and many scholars propose that it is just a contact phenomenon (e.g. Hohenberger and Happ 2001). One observation supporting these views is mouthing distribution, which is quite different from the distribution of indisputable components of signs (Crasborn et al. 2008). However, an argument supporting the hypothesis that mouthing is fully integrated into the sign language lexicon is that in many sign languages mouthing can distinguish minimal pairs of signs. For example, in LIS the signs SICILIA and PALERMO are distinguished only by mouthing. Still, one may argue that mouthing is a disambiguating resource imported from spoken language. As the debate is still open, here we apply an experimental procedure to analyze the level of integration of mouthing into the sign language system.

Method

Participants. Seventeen deaf LIS signers (mean age = 31; standard deviation [SD] = 15.70; range = 18 – 67; 6 Females, 11 Males) recruited from the members of the Deaf Institute of Turin (Italy). Ten out of seventeen participants (59%) were native signers; seven out of seventeen (41%) were first exposed to LIS during childhood. They were also proficient in written Italian.

Materials and procedure. Thirty minimal pairs of the Turin variety of LIS were used as target stimuli. The signs in the minimal pairs differed in one of five dimensions: the canonical four parameters (handshape, location, movement, palm orientation) plus mouthing. During the experiment each target sign (video recorded) was presented twice: once followed by the corresponding Italian written word and once followed by the Italian written word corresponding to the second member of the minimal pair. We exemplify this by using the minimal pair BATTITO ('beat') / MAMMA ('mom'). *Congruent condition*: BATTITO – battito (written word); MAMMA – mamma. *Incongruent Condition*: BATTITO – mamma; MAMMA – battito. The same procedure was used for all minimal pairs, including "mouthing minimal pairs" like SICILIA / PALERMO. Twenty additional pairs were added as fillers (mouthing was present in the "mouthing minimal pairs" and in half of the fillers). Right after the end of the video, the written word appeared in the middle of the screen. Participants had to press a "congruent" key if they judged the sign-word pair to have the same meaning, otherwise they had to press an "incongruent" key. Accuracy and reaction times (RTs) in ms from the onset of the printed word were measured.

Results

Incongruent condition

Table 1. *Mean (SD) of RTs and Accuracy in the Incongruent condition*		
Dimension	*RTs in ms*	*Accuracy (%)*
Mouthing	975 (626)	68 (47)
Handshape	990 (576)	83 (37)
Location	866 (284)	95 (22)
Movement	975 (473)	88 (32)
Palm Orientation	959 (394)	93 (26)

RTs analysis: the inclusion of «dimension» as a fixed factor was not significant [*p*= .45]. *Accuracy analysis:* the inclusion of «dimension» as a fixed factor was significant [χ^2 (1) =19.923, *p*<.0001] indicating that «dimension» was a predictor of accuracy. Specifically, the mouthing dimension differed from the other dimensions (all ps < .05)

Congruent condition

Table 2. *Mean (SD) of RTs and Accuracy in the Congruent condition*		
Mouthing	*RTs in ms*	*Accuracy (%)*
Present	661 (284)	98 (16)
Absent	723 (323)	95 (22)

RTs analysis: the inclusion of «mouthing» as a fixed factor was significant [χ^2 (1) =3.436, *p*=.03]. Accuracy analysis: the inclusion of «mouthing» as a fixed factor was not significant [*p*=.14].

Discussion. In the incongruent condition, in which a sign was coupled with the word corresponding to the other sign in the minimal pair, accuracy was markedly lower for minimal pairs of signs distinguished by mouthing than for minimal pairs of signs distinguished by one of the four canonical formational parameters. In order to perform the task, participants seem to have focused on the manual articulators of the sign, apparently considering mouthing external to the sign to be matched with the word. This result is fully consistent with the view that mouthing is external to the lexical representation of the sign, therefore it is more easily neglected. Therefore, lexical disambiguation by mouthing should be interpreted as simultaneous code mixing, with two lexical items from the two languages being articulated at the same time.

Results of the congruent condition, in which a sign was coupled with the corresponding Italian word, are consistent with this view. Faster reaction times were observed when mouthing was present. This might be the consequence of the strong mapping between orthography and mouthing (see Vinson et al. 2010) and suggests that mouthing is highly connected to the Italian lexicon (incidentally, this also indicates that mouthing was clearly visible in the videos, as it did fasten RTs in the congruent condition).

Our experimental findings provide interesting (yet indirect) arguments supporting the hypothesis that Italian phonology does not blend with LIS phonology, namely the lexical representation of the

sign does not include features of the corresponding Italian word. This applies also to cases in which mouthing is obligatory for disambiguation. Although this conclusion cannot be mechanically extended to other spoken language / sign language pairs, we suspect that the absence of blending may be due to deep reasons: although two phonological representations can be simultaneously activated in code mixing between a sign language and a spoken language, the two co-activated phonological systems cannot intermingle, even when nothing blocks this from a strictly articulatory point of view.

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GRADUAL RECRUITMENT OF BODY ARTICULATIONS FOR DISCOURSE STRUCTURING IN A YOUNG SIGN LANGUAGE

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Sign languages can signal several different linguistic functions simultaneously, using different parts of the body (Herrmann & Steinbach (eds.), 2013; Vermeerbergen, Leeson & Crasborn (eds.), 2007). It has been suggested that in young sign languages, different parts of the body are recruited gradually as the language matures, directly reflecting the emergence of linguistic complexity (Sandler, 2012; Matacic, 2016). Here we track this Grammar of the Body, to explore how different body articulators are recruited for marking the structure of text narratives across different age groups in Israeli Sign Language (ISL). Specifically, we find (1) a relationship between the size and/or the number of articulator movements and the level depth in the discourse hierarchy, and (2) differences across generations of signers that signal increasing complexity in the marking of levels of discourse in narratives with bodily articulators.

Research has shown that both speakers (Swerts 1997; Krivokapić & Byrd, 2012) and signers (Nespor & Sandler 1999; Boyes-Braem 1999) distinguish discourse boundaries of different strengths with non-lexical devices. Based on these results, we hypothesized that weaker levels may come to be marked by fewer and smaller articulator movements, while stronger boundaries will be marked by multiple and larger articulators, and that distinctions between levels will become more pronounced as a sign language develops over time.

To test this hypothesis, we analyzed two-minute narratives from different age groups of ISL signers, a language that originated only 80 years ago (Meir & Sandler 2008). We divided all narratives into text units using Rhetorical Structure Theory (Mann & Thompson, 1988). This theory is based on the semantic relations of one text segment to another (see Figure 1) which are organized in a recursive hierarchy of levels of discourse. For example, the level "solutionhood" may be comprised of, "motivation and enablement", which in turn may be comprised of "elaboration".

Our preliminary analysis focusses on four ISL narratives (two older, two younger). The results indicate that, while there is no one-to-one relation between specific articulator movements and levels of text organization (compatible with Fenlon 2010 for BSL), higher levels of the discourse are marked by more articulators and with greater intensity (e.g., larger movements or longer holds) than lower levels. We also found intriguing evidence for increasing complexity in the system across the age groups. Importantly, both age groups produced narratives which were characterized by several levels of discourse depth according to **semantic** criteria. However, the older signers distinguish only the two highest levels of discourse from one another overtly, with markers of the body. Levels analyzed as lower in the hierarchy on the basis of semantics were marked in the same way as level 2 (S2 in Figure 1), regardless of semantic depth. Only with younger signers is there a correspondence between different types of marking and the depth of the discourse unit in the hierarchy at lower levels. For example, younger signers use 5-6 markers at the highest level, 4-5 at

the second level followed by 2-3 markers at the third level, with a decrease in intensity at each level. The findings suggest that, as the language matures, the mapping between linguistic and semantic complexity becomes increasingly aligned. The full study to be reported will include 15 signers across three age groups, to confirm and further explore the gradual recruitment of body articulations for discourse structuring in a young sign language.
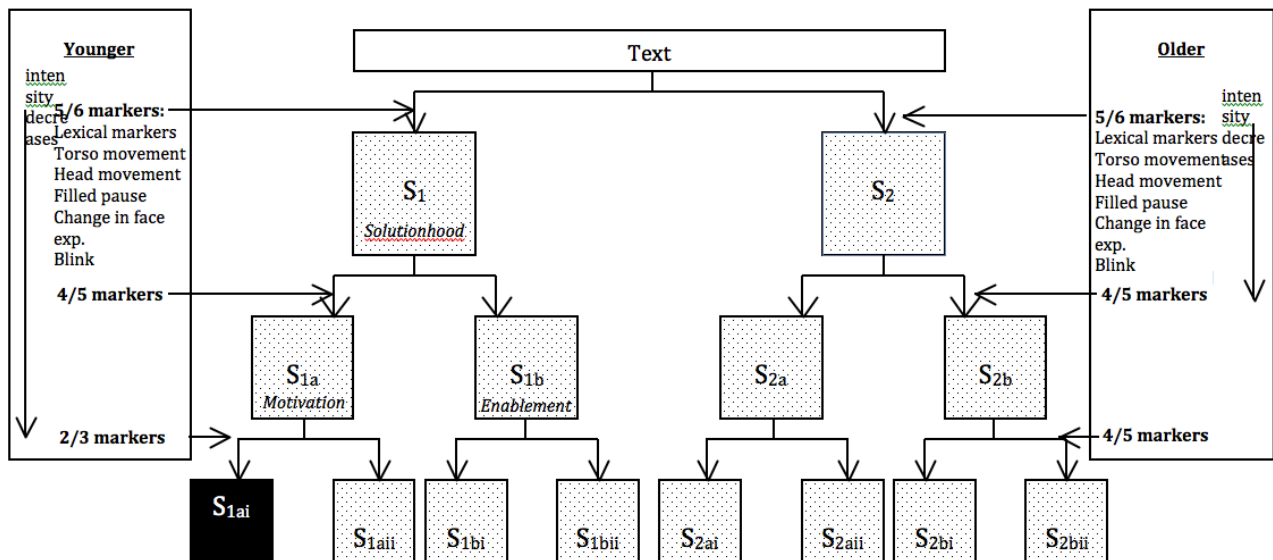

Figure 1: Hierarchy of text segmentation and the numbers/intensity of markers employed by each age group (younger on left, older on right). Younger signers show a difference in the number of markers between each level and decreasing intensity from highest to lowest, while older signers only distinguish the highest level from all lower levels regardless of relative semantic depth.

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