SIGN HUB

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D4.6 Second SIGN-HUB Conference

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Project title: The SIGN-HUB: preserving, researching and fostering the linguistic, historical and cultural heritage of European Deaf signing communities with an integral resource
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Work package: WP
Affected tasks: Task

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

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

[2] **PU**: public, **PP:** Restricted to other programme participants (including the commission services), **RE** Restricted to a group specified by the consortium (including the Commission services), **CO** Confidential, only for members of the consortium (Including the Commission services)

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1. Scope of the document

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

2. Introduction

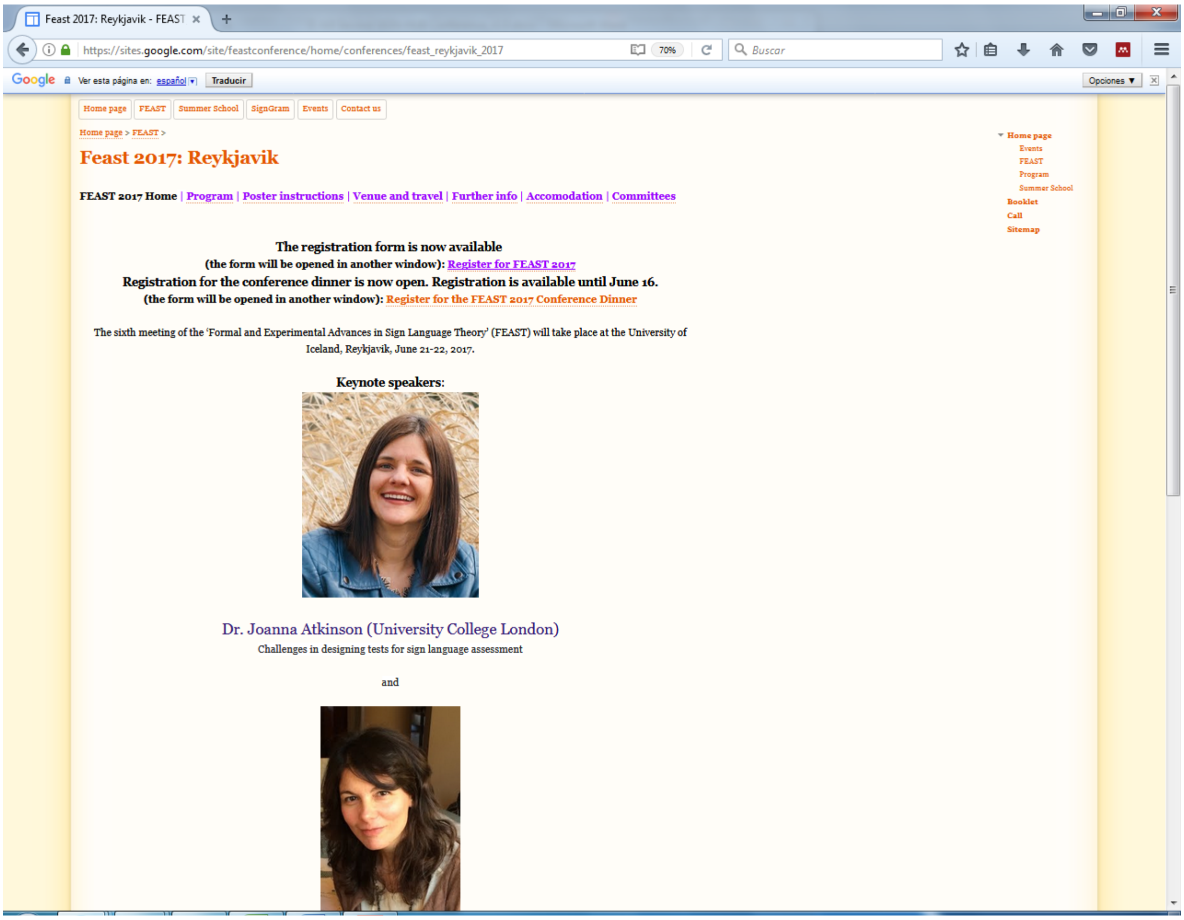
The second SIGN-HUB conference took place at the University of Iceland on June 21-22, 2017. It was the sixth edition of the "Formal and Experimental Advances in Sign language Theory" (FEAST) colloquium.

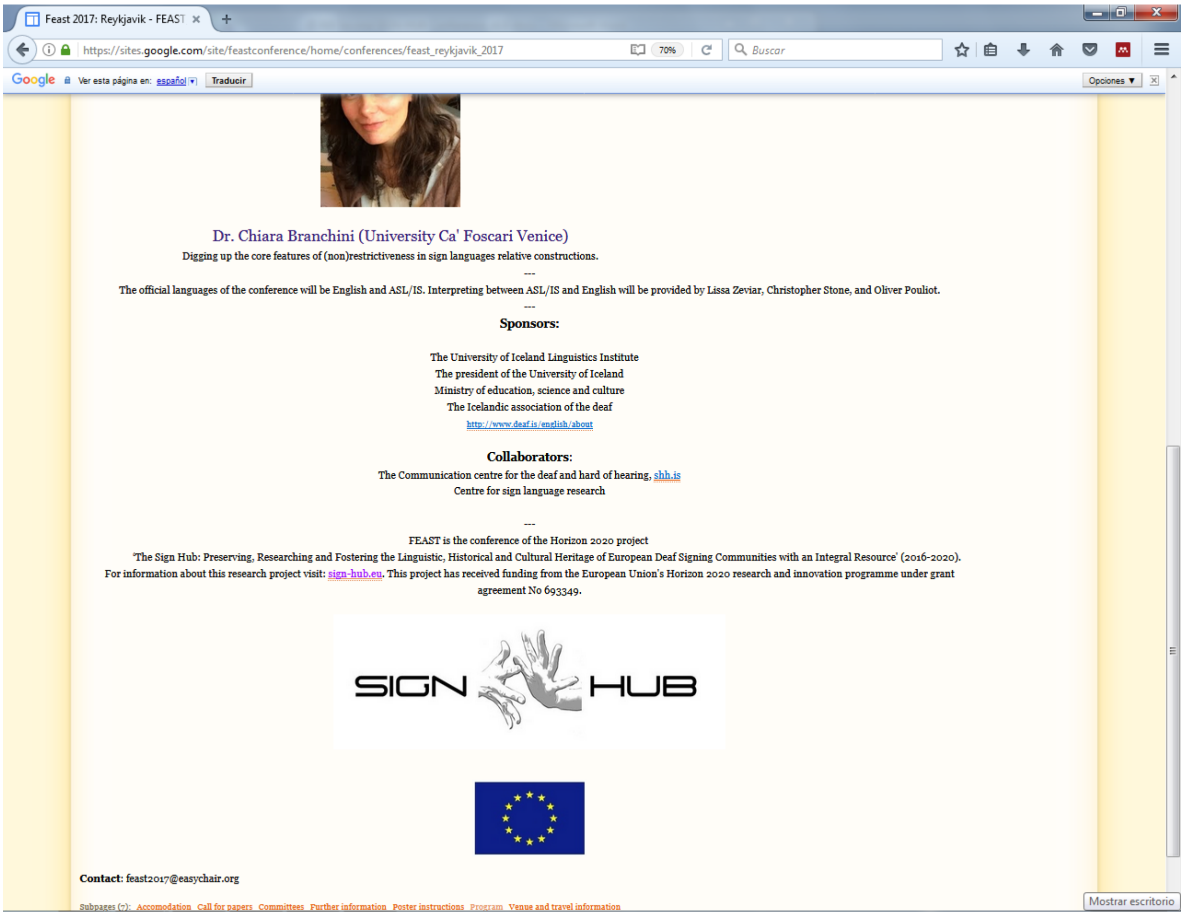
The dissemination of the conference was done through linguist lists (e.g. The Linguist List and SLLing-List) and the conference website (see Figure 1). 80 people attended the event.

16 talks were accepted for oral presentation and 12 posters were shown.

Figure 1. SIGN-HUB Conference website.

https://sites.google.com/site/feastconference/home/conferences/feast_reykjavik_2017

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Opciones
Dr. Chiara Branchini (University Ca' Foscari Venice)
Digging up the core features of (non)restrictiveness in sign languages relative constructions.

The official languages of the conference will be English and ASL/IS. Interpreting between ASL/IS and English will be provided by Lissa Zeviar, Christopher Stone, and Oliver Pouliot.

Sponsors:
The University of Iceland Linguistics Institute
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The Icelandic association of the deaf
http://www.deaf.is/english/about
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Centre for sign language research

FEAST is the conference of the Horizon 2020 project
'The Sign Hub: Preserving, Researching and Fostering the Linguistic, Historical and Cultural Heritage of European Deaf Signing Communities with an Integral Resource' (2016-2020).
For information about this research project visit: sign-hub.eu. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 693349.
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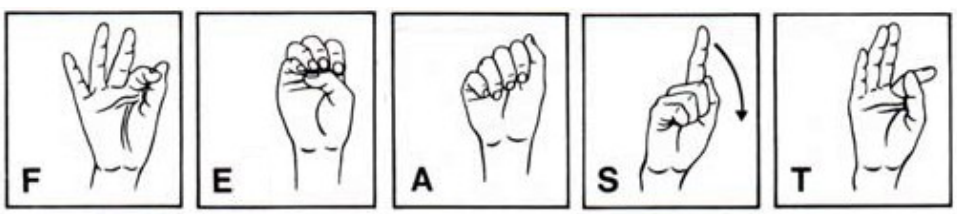
3. Abstracts book

FORMAL AND EXPERIMENTAL ADVANCES IN SIGN LANGUAGE THEORY



JUNE 21-22 , 2017

HÁSKÓLATORG, UNIVERSITY OF ICELAND, REYKJAVIK

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9.50-10.20: Coffee break

10.20-11.00: Anne Wienholz, Derya Nuhbalaoglu, Annika Herrmann, Edgar Onea, Markus Steinbach and Nivedita Mani (Georg-August University, Goettingen): The contralateral affair – An ERP study on pointing preferences in German Sign Language.

11.00-11.40: Karen Emmorey, Katherine Midgley and Phillip Holcomb (San Diego State University): Tracking the time course of sign recognition using ERP repetition priming.

11.40-12.20: Philippe Schlenker (CNRS and NYU): Iconic Pragmatics: Signs vs. Gestures.

12.20-13.30: Lunch break

13.30-14.10: Ronice Quadros (Universidade Federal de Santa Catarina), Kathryn Davidson (Harvard University), Diane Lillo-Martin (University of Conneticut) and Karen Emmorey (San Diego State University): Depicting Signs in Bimodal Bilingual Code-Blending.

14.10.-14.50: Ziyi Pan and Gladys Tang (The Chinese University of Hong Kong): Deaf Children's Acquisition of the Phonetic features of Handshape in Hong Kong Sign Language (HKSL).

14.50-15.10: Poster presentations

15.10-16.20: Coffee break and poster session (see information below)

16.20-17.00: Giorgia Zorzi (Pompeu Fabra University): Gapping vs VP-ellipsis in Catalan Sign Language (LSC).

17.00-17.40: Enoch Aboh, Marloes Oomen and Roland Pfau (University of Amsterdam): High and low negation in Sign Language of the Netherlands.

17.50-18.30: Business meeting

20.00: Social dinner at Bergsson Restaurant, in Grandi.

June 21 posters

Eva Gutiérrez-Sigut, Marta Vergara-Martínez, Ana Marcet and Manuel Perea (Universitat de València): Automatic use of phonological codes during word recognition in deaf signers of Spanish Sign Language.

Francie Manhardt, Susanne Brouwer, Beyza Sümer, Dilay Z. Karadöller, and Asli Özyürek (Radboud University Nijmegen & Max Planck Institute for Psycholinguistics Nijmegen): The Influence of Iconic Linguistic Expressions on Spatial Event Cognition across Signers and Speakers: An Eye-Tracking Study.

Chuck Bradley and Huda Nassar (Purdue University): Rapid processing of ELAN data: quick and dirty numbers for statistical analysis of non-manual features.

Justyna Kotowicz (Pedagogical University, Cracow), Bencie Woll (University College London), Rosalinda Herman (City University London), Magda Schromová (University of Warsaw), Maria Kielar-Turska (Jagiellonian University) and Joanna Łacheta (University of Warsaw): Executive function in deaf native signing children: the relationship of language experience and cognition.

Caroline Bogliotti (Paris Nanterre University & CNRS), Celine Fortuna (Paris 8 University) and Aliyah Morgenstern (Sorbonne Nouvelle University & PRISMES Lab): Sentence Repetition Task in French Sign Language: a new approach to assess LSF abilities.

Süleyman S. Tasci (Koc University & Bogazici University), Beyza Sumer (Koc University), and Sumeyye Eker (Koc University): Comparison of iconicity judgments by Deaf signers and hearing non-signers.

June 22 presentations

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9.40-10.20: Natasha Abner (Montclair State University), Elena Koulidobrova (Central Connecticut State University), Ronnie Wilbur (Purdue University), and Dr. Sandra Wood (University of Southern Maine): When beat is *exceed*: verbal comparison in American Sign Language.

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10.50-11.30: Laura Horton, Lilia Rissman, Susan Goldin-Meadow and Diane Brentari (University of Chicago): The Emergence of Agent-Marking Strategies in Child Homesign Systems.

11.30-12.10: Jennie Pyers (Wellesley College) and Ann Senghas (Barnard College): The emergence of spatial language in Nicaraguan Sign Language: A transition from analogical to categorial forms?

12.10-13.20: Lunch break

13.20-14.10: Chiara Branchini – invited speaker (University Ca' Foscari Venice): Digging up the core features of (non)restrictiveness in sign languages relative constructions.

14.10-14.50: Wenjing Zhao, Pan Ziyi and Gladys Tang (The Chinese University of Hong Kong): The Perception of Handshapes in the Hong Kong Sign Language (HKSL).

14.50-15.30: Matic Pavlič (University of Nova Gorica): The dominant and non-dominant hand movement in Slovenian Sign Language locative constructions.

15.30-15.50: Poster presentations

15.50-17.00: Coffee break and poster session (see information below)

17.00-17.30: Josep Quer (ICREA- Pompeu Fabra University) and Carlo Cecchetto (University Paris 8/CNRS & University of Milan-Bicocca): Contributions of SIGN-HUB to sign language research.

17.30-18.10: Vadim Kimmelman (University of Amsterdam): Null arguments, agreement, and classifiers in RSL.

18.10-18.50: Philippe Schlenker (CNRS and NYU) and Jonathan Lamberton (CUNY): Iconic Plurality in ASL.

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June 22 posters

Lara Mantovan, Beatrice Giustolisi and Francesca Panzeri (University of Milan-Bicocca): Signing Irony in LIS.
Laetitia Puissant-Schontz, Martine Sekali and Caroline Bogliotti (Université Paris Nanterre & Laboratoire MODYCO – CNRS): Assessing morphosyntactic skills in LSF (French Sign Language): focus on predicative structures.

Kazumi Matsuoka (Keio University), Uiko Yano (Japan Deaf Evangel Mission) and Kazumi Maegawa (Kwansei Gakuin University): Modal-negation interactions in Japanese Sign Language.

Sandra Wood (McDaniel College): Never Say Never: You never know what it might mean.

Julia Krebs (University of Salzburg), Evie Malaia (Purdue University), Ronnie Wilbur (Purdue University) and Dietmar Roehm (University of Salzburg): The processing of locally ambiguous classifier constructions in Austrian Sign Language (ÖGS).

Elisabeth Volk (University of Göttingen): Palm-up: It's not all about give and take.

Annemarie Kocab (Harvard University), Ann Senghas (Barnard College) and Jesse Snedeker (Harvard University): The emergence of recursion in Nicaraguan Sign Language.

Presentation abstracts

Challenges in Designing Tests for Sign Language Assessment

Joanna Atkinson

Researchers at the Deafness, Cognition, Language and Research Centre at University College London have developed many tests for the assessment of deaf children and adults, and have recently made these available for online testing to practitioners, educators and researchers via the DCAL Assessment Portal https://dcalportal.org/

This talk will provide an overview of the many challenges inherent in developing these sign language tests. Dr Joanna Atkinson is a neuropsychologist who has developed test batteries for assessing aphasia and dementia in deaf signers. She and her colleagues developed the online portal which enables practitioners and researchers to use sign language assessments - developed during twenty years of BSL research - in their clinical work, educational assessment and research experiments. The talk will focus on how we approached the challenges in test design, the choices we made during development, and how we would do things differently with the benefit of hindsight. It is hoped that these insights will stimulate debate and be useful for international teams developing tests for different sign languages.

The contralateral affair – An ERP study on pointing preferences in German Sign Language

Anne Wienholz[1], Derya Nuhbalaoglu[1], Annika Herrmann[2], Edgar Onea[1], Markus Steinbach[1] & Nivedita Mani[1]

([1]Georg-August University of Goettingen, [2]University of Hamburg)

Background:

Research suggests that one of the strongest preferences driving pronoun resolution in spoken languages is the first mention bias (Crawley & Stevenson, 1990; Gernsbacher & Hargreaves, 1988; i.a.). Namely, the first mentioned referent, which is usually but not necessarily the subject of the sentence, is most accessible, and typically expected to co- refer with (personal) pronouns. The first mention bias is under-investigated in sign languages, and the few studies there are concentrate on a small range of pronominal elements in some sign languages. For instance, Emmorey & Lillo-Martin (1995) observe no first mention bias for ASL null pronouns, while Koulidobrova & Lillo-Martin (2016) mention that the majority of overt third person pronouns in the CLESS Corpus of ASL, compiled by Lillo-Martin & Pichler (2008), refer to the subject/first mentioned referent. The present study is the first experimental study investigating the reality of a first mention bias in the discourse of German Sign Language (DGS).

The present study:

We collected ERP data from 21 right-handed deaf native signers of DGS (12 female, 9 male, age range: 20-51 years) as they watched prerecorded videos of signed sentences in DGS. The participants learned DGS before the age of three, had a least high school education level and came from different regions of Germany.

The stimuli comprised sentence sets (see example 1) containing two discourse referents (DRs) without any overt localization in the first sentence and a pronoun (INDEX) at the beginning of the second sentence followed by a predicate. These sentence sets varied in the direction of the INDEX sign, which functions as a pronoun in this case. This pronoun either picked up the first mentioned or second mentioned referent from the preceding sentence.

Previously, Geraci (2014) and Steinbach & Onea (2016) claimed that, in case there are two DRs, the first referent is established on the ipsilateral (right) area and the second referent is linked to the contralateral (left) area in signing space. An ERP study by Wienholz et al. (2016) showed that this pattern is a default strategy for

DGS in the absence of any localization cue. Given this, in (1ab) the pronoun INDEXR establishes an anaphoric link to the first referent and accordingly in (1cd) the INDEXL refers to the second referent.

(1)	a.	WOMAN	MAN	MEET.	**INDEX$_R$**	AGAIN	PREGNANT.	ipsilateral condition
	b.	MAN	WOMAN	MEET.	**INDEX$_R$**	AGAIN	PREGNANT.	
	c.	WOMAN	MAN	MEET.	**INDEX$_L$**	AGAIN	PREGNANT.	contralateral condition
	d.	MAN	WOMAN	MEET.	**INDEX$_L$**	AGAIN	PREGNANT.	

'A man/woman meets a woman/man. She/he is pregnant again.'

There are three possible scenarios for the results: (i) the ERPs do not differ across conditions, (ii) increased brain activity in the ipsilateral condition, which would speak in favor for a second mention effect and (iii) increased activity in the contralateral condition, supporting the notion of a first mention effect. 160 stimuli(80 for each condition) were video-recorded with two right-handed fluent deaf signers of DGS, digitized, and then presented on a computer screen to the participants at the rate of natural signing. The stimuli were controlled for nonmanuals and verb types. Three different points in time (including the time window before the sign onset) of the INDEX sign were manually coded by two researchers for the later analysis. The following results are based on the trigger 'direction' specified for the INDEX.

Results:

The data show a significant difference between the two conditions ($t(19)= 2.236$; $p=.038$) in the time window 400-500ms following onset of the trigger 'direction' over parietal-occipital regions in the right hemisphere, with the contralateral condition being more negative than the ipsilateral condition. Hence, the results seem to confirm scenario (iii). This suggests increased processing costs for the contralateral INDEX sign: It appears that participants expect the second sentence to continue with the first referent. In cases where the second sentence continues with the second referent, this expectation gets violated and causes the observed effect. Based on the above mentioned studies showing that referents are also covertly associated with areas in space, the effect can be interpreted as an effect of first mention. However, we cannot rule out that the contralateral area itself, rather than the location of the second referent, assigned to it, is responsible for the effect.The current study is the first to experimentally show a difference between pronominal pointings to ipsi/contralateral areas in signing space for DGS.

References:

Crawley, R. A., & Stevenson, R. J. (1990). Reference in single sentences and in texts. Journal of Psycholinguistic Research, 19(3), 191–210. doi:10.1007/BF01077416

Emmorey, K., & Lillo Martin, D. (1995). Processing spatial anaphora: Referent reactivation with overt and null pronouns in American Sign Language. Language and Cognitive Processes, 10(6), 631–653.

Geraci, C. (2014). Spatial syntax in your hands. In J. Iyer & L. Kusmer (Eds.), Proceedings of the Forty-Fourth Annual Meeting of the North East Linguistic Society (Vol. 1, pp. 123–134). Amherst: GLSA.

Gernsbacher, M. A., & Hargreaves, D. J. (1988). Accessing sentence participants: The advantage of first mention. Journal of Memory and Language, 27(6), 699–717. doi:10.1016/0749-596X(88)90016-2

Koulidobrova, E., & Lillo-Martin, D. (2016). A "point" of inquiry: The case of the (non-) pronominal IX in ASL. In P. Grosz & P. Patel-Grosz (Eds.), The Impact of Pronominal Form on Interpretation (pp. 221–250). Berlin, Boston: De Gruyter Mouton.

Lillo-Martin, D., & Pichler, D. C. (2008). Development of sign language acquisition corpora. In Proceedings of the 3rd Workshop on the Representation and Processing of Sign Languages (pp. 129–133). Citeseer.

Steinbach, M., & Onea, E. (2016). A DRT Analysis of Discourse Referents and Anaphora Resolution in Sign Language. Journal of Semantics, 33(3), 409–448. doi:10.1093/jos/ffv002

Wienholz, A., Nuhbalaoglu, D., Herrmann, A., Onea, E., Steinbach, M. & Mani, N. (2016, September). Pointing to the right side? An ERP study on anaphora resolution in German Sign Language. Paper presented at the conference on Formal and Experimental Advances in Sign Language Theory (FEAST), Venice, Italy.

Tracking the time course of sign recognition using ERP repetition priming

Karen Emmorey, Katherine J. Midgley, and Philip J. Holcomb - San Diego State University

A well documented finding in cognitive electrophysiology is the attenuation of the N400 ERP component to repeated compared to unrepeated words (e.g., Rugg, 1990). This effect is interpreted as reflecting thedecreased difficulty associated with integrating lexico semantic representations (Holcomb et al., 2005). We used a sign repetition priming paradigm to examine the time course of priming effects for American Sign Language (ASL). Whileprevious studies have shown priming effects on the N400 for ASL signs in a sentence context (e.g., Neville et al., 1997), this is the first study to examine ERPs in a sign by sign repetition priming paradigm specifically designed to track the time course of sign processing. Given that signs are dynamic stimuli, we asked whether there was an advantage for time locking the ERP recording to sign onset (i.e., when the hand reaches the target locationon the body or in signing space) compared to video onset (i.e., when the hand(s) move from the resting position on the lap). Thirty two deaf ASL signers performed a go/no go semantic categorization task (press to occasional signs for people, e.g., POLICEMAN) to 235 video clips of ASL signs. Forty items were repeated on the next trial. Twenty eight sign naïve hearing participants also viewed the same stimuli, but because they did not know ASL, their task was to press to occasional signs that contained a dot superimposed at different locations near the face of the signer.

The ERP data revealed that time locking to video onset (Figure 1A) produced a significant attenuation of the N400 component for repeated compared to unrepeated signs in deaf participants, beginning ~500 ms after the clip onset. The N400 effect had the typical central parietal distribution seen in previous studies using spoken words. The hearing participants revealed a very different pattern, instead of an attenuation of the N400, they showed a significant increase in negativity for repeated compared to unrepeated signs. This is the first study to show this pattern, which suggests that repeated items are unexpected for non- signers but are more easily recognized for signers. Figure 1B shows the same comparison but now time locked to sign onset. In this case, the N400 effect in deaf signers starts near or before sign onset while the effect for hearing non signers remains in the opposite direction (i.e., not an N400 priming effect). The early onset of the N400 likely reflects the presence of linguistic information in the video prior to sign onset. Such transition information may provide phonological cues that deaf signers use to access lexical signs prior to sign onset, leading to earlier repetition priming effects.

To help address this issue, we modified our sign repetition paradigm such that the video clips of each sign were edited to begin three frames (~100 ms) before sign onset. If our above explanation is correct, then these “clipped” signs should produce robust N400 repetition effects in deaf signers, but the effect should onset in the typical N400 epoch, between 200 and 300ms. Fifteen deaf signers participated in this follow up experiment. As can be seen in the Figure 2, the time course of the N400 repetition effect almost perfectly matches the time course seenin comparable studies with written words. The N400 effect (the blue patch) starts near 300 ms and is complete by around 650 ms. These data suggest that future studies of sign language processing should use this technique when probing the time course of priming effects for signs.

Overall, these results indicate that signers rapidly utilize phonetic information that is available early in the signed signal to access lexical representations. This conclusion is bolstered by the findings with hearing non signers who had no lexical or semantic knowledge of the stimuli. In these participants repetition priming was in the opposite direction (more positive- going ERPs for unrepeated signs), which likely reflects their general sensitivity to the repetition of structurally complex but linguistically meaningless visual events.

References

Holcomb, P.J., Anderson, J., Grainger, J. (2005). An electrophysiological study of cross modal repetition priming. Psychophysiology, 42, 493-507.

Rugg, M. (1990). Event related brain potentials dissociate repetition effects of high- and low- frequency words. Memory and Cognition, 18, 367–379.

Neville, H.J., Coffey, S.A., Lawson, D.S., Fischer, A., Emmorey, K., Bellugi, U. (1997). Neural systems mediating American sign language: effects of sensory experience and age of acquisition. Brain and Language, 57 (3), 285–308.

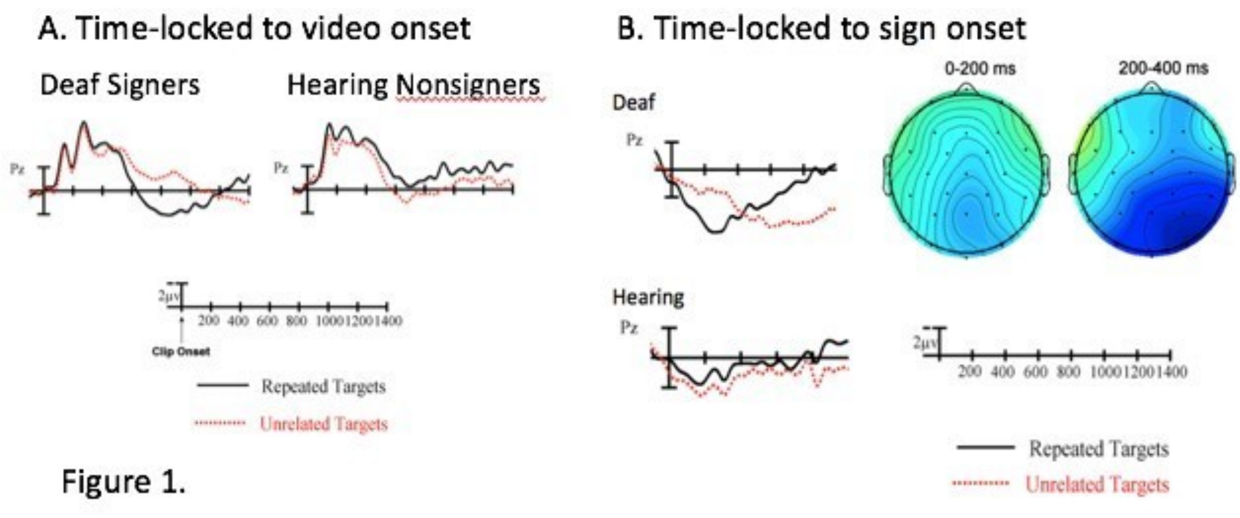


Figure 1.

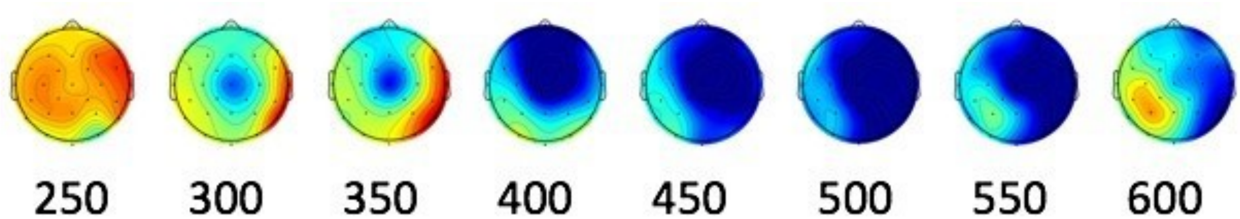


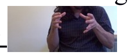
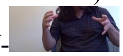
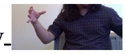
Figure 2: Time-locking to video onset; videos clipped to begin 3 frames prior to sign onset.

Iconic Pragmatics: Signs vs. Gestures

Philippe Schlenker (Institut Jean-Nicod and NYU)

Introduction: An expression may be called *iconic* if there is a structure-preserving map between its form and its denotation (e.g. Schlenker et al. 2013). In (1)a, the length of the talk referred to is an increasing function of the length of the vowel. In the ASL example in (1)b, the final degree of growth is an increasing function of the maximal distance between the two hands realizing the verb *GROW.*

(1) a. The talk was long / loooooong. (cf. Okrent 2002)

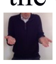
b. POSS-1 GROUP GROW- / GROW- / GROW-

'My group has been growing a bit / a medium amoung / a lot.' (ASL; 8, 263; Schlenker et al. 2013)

Recent work in sign language semantics argues that (i) when iconic phenomena are disregarded, sign and spoken language share the same 'logical spine' (e.g. Schlenker

2011,2013,2014,forthcoming), but (ii) sign language makes use of richer iconic resources, including at its logical core (e.g. Schlenker et al.2013). But as emphasized by Goldin Meadow and Brentari (to appear), one should not compare sign to speech, but rather to speech plus gesture. The key semantic question is *whether speech plus gesture has comparable expressive resources as sign with iconicity.* We argue that *even* when co speech gestures are incorporated into spoken language, there remain systematic differences between speech plus gestures and sign with iconicity, because most sign language iconic enrichments can be at-issue, whereas co speech gestures are normally not at issue. **Playback method:** ASL data were elicited through *repeated* quantitative acceptability judgments (7- point scale, with 7=best) and inferential judgments obtained from a Deaf native signer of ASL.

A. We sharpen the debate by introducing **a distinction between two iconic enrichments**: in 'internal enrichments', the form of an expression is iconically modulated to affect the meaning of that very expression, as in (1)a b; in 'external enrichment', an expression is iconically enriched by an *extrane- ous* element, as in (2) (enrichment of *help* by a co speech gesture). A fully typology is discussed in **B**. **Notation:** co speech gestures appear *before* the expressions they co-occur with (these are **boldfaced**).

(2) Will John  **help** his son? (=> if John helps his son, lifting will be involved).

External and internal enrichments interact differently with logical operators. The internal enrichments in (1) behave like standard at issue (=assertive) contributions and can take scope under logical operators, thus (3)a means something like 'If the talk is *very long*, I'll leave before the end' (with no implication about what would happen if the talk is just somewhat long); similarly, (3)b means that if my group grows *a lot*, John will lead it.

(3) a. If the talk is loooooong, I'll leave before the end.

At-issue contribution: If the talk is very long, I'll leave before the end.

b. …IF POSS-1 GROUP GROW_broad, IX-b JOHN LEAD. (ASL, 33, 71; 2 trials)

A-issue contribution: If my group grows a lot, John will lead it.

We argue that another instance of iconic modulation, repetition based plurals arranged in various shapes, also gives rise to at issue contributions, as shown by (4), where the boldfaced component takes scope within the *if*-clause. (Note: Acceptability judgments on sentences are on a 7-point scale).

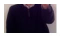
(4) *Context:* The speaker will be renting the addressee's apartment; he knows it contains trophies, but he hasn't seen them.

POSS-2 APT IF HAVE ________, IX-1 ADD 20 DOLLARS. a. 7 TROPHY-rep-3horizontal

=> if there at least three or four trophies **in a horizontal line**, $20 will be added.

b. 6.7 TROPHY-rep-3triangle

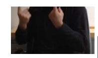
=> if there are at least 3 trophies **forming a triangle**, $20 will be added. (ASL, 32, 0096c-f; 4 judgments)

By contrast, co speech gestures give rise to a variety of presuppositions, called 'cosuppositions' in Schler 2017 because they are conditionalized on the assertive component of the expression they modify. Thus *x* ***helps*** *y* triggers the presupposition that *if x helps y, lifting is involved* – and this presupposition is inherited by the question in (2). Similarly, *x*  ***punished*** *y* triggers the presupposition that *if x punished y, slapping was involved.* Since presuppositions under *none* type quantifiers give rise to universal inferences (Chemla 2009), as illustrated in (5)b, we can explain why (5)a triggers a universal, conditional inference. Numerous arguments for the cosuppositional theory of co-speech gestures are laid out in Schlenker 2017 (against Ebert and Ebert 2014), and several are confirmed with experimental means in Tieu et al. 2017 by way an inferential task.

(5) a. None of these 10 guys  **punished** his son.

=> for each of these 10 guys, if he had punished his son, slapping would have been involved b. None of these 10 guys regrets coming => each of these 10 guys came

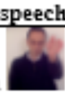
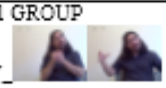
We argue that co sign gestures displaying a cosuppositional behavior can be found in sign language, namely the disgusted (non grammatical) facial expression (in (6) (modifying the VP). It triggers the inference that for *each* poor state, if it spent money, this would be bad/difficult, which replicates the type of universal projection behavior seen with the co-speech gesture in (5)a.

(6) 6 AMERICA [RICH STATE-rep HELP PEOPLE]b. [POOR STATE-rep NONE IX-arc-a :-(_**[SPEND MONEY]**]a

=> it is bad (3/4 judgments) or difficult (1/4 judgment) for poor states to spend money

'In the US, rich states help people. But no poor states spend money.' (ASL, 34, 1670a,c,d; 4 judgments)

B. We propose **a richer and new typology** ((7)) in which each type of enrichment (external vs. internal) is further subdivided depending on whether it comes without a separate time slot (as is the case of all the enrichments discussed so far), or comes with a separate time slot. Internal enrichments that have their own time slot are just word replacing ('pro speech') gestures; these have an at issue contribution. External enrichments that have their own time slot are 'post speech/sign gestures', which come *after* the expressions they modify; we show that in both modalities they behave like appositives. **Notation:** post speech/sign gestures come after the expressions they modify after a pause written – .

(7)	**External enrichments (= syntactically eliminable)**		**Internal enrichments (= syntactically ineliminable)**	
	No separate time slot: **Co-speech/sign gestures**	Separate time slot: **Post-speech/sign gestures**	No separate time slot: **Iconic modulations**	Separate time slot: **Pro-speech/sign gestures**
Speech	John  **punished** his son.	John punished his son – .	The talk was loooooong.	Your brother, I am going to .
Sign	IX-arc-b NEVER  [SPEND MONEY]	IX-arc-b NEVER SPEND MONEY], – .	POSS-1 GROUP GROW_	[currently unclear]
Meaning	**cosuppositions** (=conditionalized presuppositions)	**supplements (= like appositives)**	**at-issue or not**, depending on the case	**at-issue**, with an additional non-at-issue component in some cases

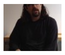
The similarity between post speech gestures and appositives is brought out in (8)b c, where both are acceptable under *some* and unacceptable under *every* (here *LARGE* stands for a gesture for a large bottle). By contrast, a co-speech gestures as in (8)a is acceptable in both environments.

(8) a. Some/No philosopher brought LARGE **[a bottle of beer]**.

b. Some/#No philosopher brought a bottle of beer, which (by the way) was LARGE **this** large. c. Some/#No philosopher brought a bottle of beer – LARGE.

In ASL, the post-sign disgusted facial expression *:-(* in (9) behaves differently from its co-sign counterpart in (6). It does not modify the VP, but rather the full clause, hence: it is bad that no poor state spends money, and thus it would be *good* if they were to spend money – hence the opposite from the inference obtained in (6). Similar contrasts with facial expressions can also be obtained in English.

(9) 7AMERICA [RICH STATES HELP PEOPLE]b. [POOR STATES NONE IX-arc-a SPEND MONEY]a -

:-(_ => the speaker would be happy if poor (and rich) states spend money (ASL, 34, 1670b,c; 4 judgments)

Depicting Signs in Bimodal Bilingual CodeBlending

Ronice Quadros (Universidade Federal de Santa Catarina), Kathryn Davidson (Harvard University), Diane LilloMartin (University of Connecticut) and Karen Emmorey (San Diego State University)

Code blends: Like other bilinguals, bimodal (sign/speech) bilinguals ("bibis") do not fiercely separate their languages, but allow them to intermingle in appropriate contexts and in rule governed ways. For bibis, one language mixing option is code blending, simultaneous production of (parts of) an utterance in both speech and sign. In the Language Synthesis model of bilingualism, a bimodal utterance involves a single derivation, so codeblends should be limited to materials that share underlying syntactic structure and semantics (LilloMartin, Quadros, and Chen Pichler 2016). A frequent type of blending is co insertion: simultaneous production of lexical items in sign and speech corresponding to the same abstract root (e.g. saying "cat" in English while signing CAT in ASL). However, synthesis is also found in cases of code blended production of both languages when there are less obvious lexical equivalents. We focus on this latter case, and in particular when the sign language uses 'depicting' or 'classifier' forms, representations of action conveyed in a way that preserves some iconic aspects of their meaning. The question we investigate here is what kind of spoken language material is blended with these depicting signs and what this can tell us about how we should analyze their underlying syntactic and semantic structure.

DS: The semantic approach we test here is that classifiers/depicting signs (DS) may involve a *demonstration* (seen also in constructed action and quotation), where part of the linguistic form contributes to its meaning, as part of an "adverbial" modification of the verb phrase (Zucchi, Cecchetto, and Gerci 2012, Davidson 2015). We also adopt the essentials of the syntactic analysis of these signs by Benedicto and Brentari (2004). Given our model of bilingualism, under such an analysis, DS should be able to be produced simultaneously with speech that occurs in the verbal structure, such as a main verb, or the verb and a direct object, or the verb and any modifers (e.g. adverbs, prepositional phrases). The above also has a gestural/demonstrational component in the verbal structure introduced by the classi er projection (*cl*), and so we might expect vocal gestural information (e.g. sound e ects) to also be potentially blended with DS. What would be unexpected are DS that occur in blends with speech that includes a subject or any peripheral material (such as topicalized elements) that do not occur within the verb phrase.

Data source: Our data come from in depth analysis of the language production of four adult bibis: three Coda in the United States (bilingual in ASL/English) and one Coda from Brazil (Libras/Brazilian Portuguese). In the United States, participants were given overt instructions that they would be interacting with another Coda and should use a combination of sign and speech that felt natural. They interacted with each other spontaneously as well as addressed questions that were given to them in writing; in addition, they viewed the "Canary Row" cartoon and retold it to their Coda interlocutor. In Brazil, the participant viewed and retold a story from a Charlie Chaplin movie. All signs in bibis' production that could clearly be classified as DS (and not a lexical or pointingsign) were analyzed for potential blends with spoken language.

Results: As expected, DS occurred with a variety of spoken language expressions. The accompanying figures show the overall distribution of spoken language that accompanied DS by the 1 Brazilian participant and the3 US participants, including various lexical categories, as well as sound effects and no words (unimodal sign). Overall, the distributions showed characteristics that are predicted under a demonstrational analysis: some verbal gestures (sound effects), some choices not to blend at all, and verb phrase material (verbs, objects, and prepositions) (1). Between the language pairs the distributions were also quite similar, except for more prepositions and subjects in the US. The prepositional difference we suspect may be due to a syntactic difference between their use in English and Brazilian Portuguese, but in any case, prepositional phrases would be expected in a demonstrational account. Subjects present a more interesting case.

Davidson's (2015) demonstrational analysis assumes a syntax of entity and handling type DS in ASL based on Benedicto and Brentari (2004), in which syntactic subjects have different status in these two types, such that thefull morphosyntactic structure of a handling DS includes a agentive subject, while entity DS do not. Therefore, we further investigated all those DS (all were from US participants) that were initially coded as blending with subjects, and separated them into classifier type. Of the 10 DS blended with subjects, a total of 8 were handling verbs, 1 involved SASS, and 1 was an entity classifier, but that was coded as having somewhat atypical timing. Analysis of exceptions thus ended up being an additional source of support for our hypothesis.

Summary: By making use of the specific predictions of both a theory of bimodal bilingual code blending, and theories of classifier syntax and semantics, we were able to predict a pattern of code blending with DS. Our analysis of bimodal bilingual language production found a consistent pattern in two separate language pairs, lending further support to these independent, and independently motivated, theories of bilingual language structure and semantic/syntactic analysis, and we hope can also serve as an example for future work investigating linguistic structure through bimodal bilingualism.

(1)(a) ASL: DS(climbuppipe) Engl: climb

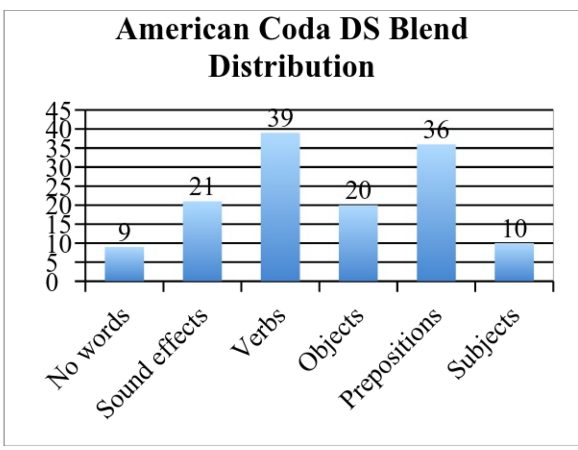
(He) climbed (up the pipe).

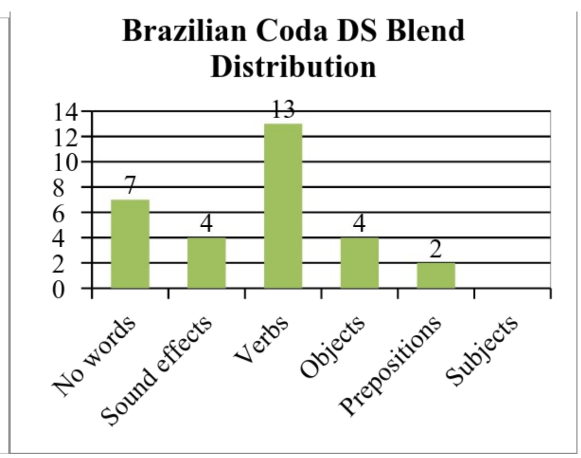
(b) ASL: DS(acrossthestreet) Engl: across the street

(*He walked) across the street.*

..................Column Break..................

(c) ASL: DS(movingforward) Engl: &=soundeffect'oooo' *(He) went rolling forward like this.*





References

Benedicto, E., and D. Brentari. (2004) Where did all the arguments go?: Argumentchanging properties of classifiers in ASL. Natural Language & Linguistic Theory 22.4: 743810.

Davidson, K. (2015). Quotation, Demonstration, & Iconicity. Linguistics & Philosophy, 477–520. LilloMartin, D., R. Müller de Quadros, and D. Chen Pichler (in press). The development of

bimodal bilingualism: Implications for linguistic theory. Invited keynote paper for epistemological issue, Linguistic Approaches to Bilingualism.

Zucchi, S., Cecchetto C., & Geraci, C. (2012). Event Descriptions and Classifier Predicates in

Sign Languages. Presentation FEAST in Venice, June 21, 2011.

Deaf Children's Acquisition of the Phonetic features of Handshape in Hong Kong Sign Language (HKSL)

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Abstract

Previous literatures on handshape acquisition mainly focus on studying handshape as a whole (Boyes Braem 1973, McIntire 1977, Bonvillian and Siedlecki 1996, Meier et al. 1998, Conlin et al. 2000, Marentette and Mayberry 2000). Only a handful of studies attempted to decompose handshape into phonetic features for more fine-grained analysis based on specific phonological models. Karnopp (2002) working on deaf children's handshape acquisition in Brazilian Sign Language made use of the principles in Dependency Phonology (Anderson 1987, Hulst 1995) and established an order of acquisition for 'elements' under the Handshape Configuration node, which is constituted by a Nucleus (e.g. selected fingers), a Complement (e.g. finger configuration) and a Specifier (e.g. orientation). Features associated with the properties of the complement or specifier were found to be acquired later by children. In another study, Wong (2008) examined the acquisition of HKSL handshape of a deaf child born to deaf parents, leading to some modifications of the Prosodic Model originally developed by Brentari (1998). Further to the dependent structure of the nodes in the model, Wong assigned markedness values to the features under each node in an attempt to explain the acquisition order of handshapes in a much finer way. Based on longitudinal data, Wong found some evidence to support the hierarchical structure of the class nodes and the features in the modified Prosodic Model.

To extend her preliminary analysis, we focus on the phonetic features in the Joint Position node. Anatomically speaking, all changes across different handshapes can be explained by the alternation in quantity (and/or degrees) of joint flexion/extension of the five individual fingers. In HKSL, one observes that phonemic contrasts in handshapes are not specified beyond the Joint position node. Features in Finger Position, i.e. the spreadness of fingers, have not been observed to contribute to phonemic contrast in HKSL so far. In other words, whether deaf children can successfully acquire joint configurations or not is an important indicator of their progress in handshape development. For the features in the Joint Position node, Wong integrated the physiological (Ann, 2003) and typological (Eccarius, 2002) accounts in markedness ranking, from unmarked to marked features: [extend]<[base and nonbase flex], [base flex]<[nonbase flex]. As noted, she did not make any further distinction between the features of [base and nonbase flex] and [base flex].

This current research aims to refine the findings on the markedness ranking of those joint features, as well as to examine the validity of the Handshape Unit Model based on longitudinal data of two deaf children born to deaf parents. In the analysis, only one-handed signs without handshape change were included in the current study. Generally speaking, around 18 out of 60 hanshapes listed in Tang (2007) were attempted by both deaf children. Handshapes errors were categorized into two groups: 1) error that involved only joint features and 2) error that involved features in other nodes (e.g. Quantity node and Finger position). We found that the joint position

feature [extend] was acquired early. Also, the joint feature [base & non-base flex] was acquired earlier than the other two features, (i.e. [base flex] and [non-base flex]), a result slightly different from Wong's because she claimed no order of acquisition with [base and non-base flex] and [base flex]. On the other hand, similar to Wong (2008)'s analysis, handshapes with a [base flex] feature was acquired later and was substituted by other joint positions (e.g. [extend] or [base & non-base flex]), but not the other way round. Based on the findings, a refined markedness ranking of joint features was tentatively proposed as: [extend]<[base and nonbase flex]<[base flex]<[nonbase flex], based on the acquisition data in HKSL.

References:

Anderson, J. & EWEN, C. (1987). Principles of dependency phonology. Cambridge: CambridgeUniversity.

Ann, J. (1993). A linguistic investigation of the relationship between physiology and handshape.Doctoral dissertation.University of Arizona, Tucson.

Boyes Braem, P. (1973). A study of the acquisition of the DEZ in American Sign Language.Unpublished manuscript, Salk Institute at La Jolla, CA.

Bonvillian, J. D., and Siedlecki, T. (1996). Young Children's Acquisition of the Location Aspect of American Sign Language: Parental Report Findings. Journals of Communication Disorders, 29 (1), 13-35.

Brentari, D. (1998). A prosodic model of sign language phonology. Cambridge, Mass.: MIT Press. Conlin, Kimberly E., et al. (2000). "The acquisition of first signs: Place, handshape, and movement." Language acquisition by eye, 51-69.

Eccarius, P. (2002). Finding common ground: A comparison of handshape across multiple sign languages. Master's thesis.Purdue University, Wes Lafayette, Indiana.

Eccarius, P., &Brentari, D. (2008).Handshape coding made easier A theoretically based notation for phonological transcription. Sign Language & Linguistics, 11(1), 69-101.

Hulst, H. V. D. (1995). Dependency relations in the phonological representation of signs. Bos & Schermer.

Karnopp, L. B. (2002). Phonology acquisition in Brazilian Sign Language.In Directions in sign language acquisition, ed. Gary Morgan and BencieWoll. Amsterdam: John Benjamins Publishing Company

Marentette, P. F., Mayberry, R. I., Chamberlain, C., Morford, J. P., & Mayberry, R. I. (2000). Principles for an emerging phonological system: A case study of early ASLacquisition. Language acquisition by eye, 71-90.

McIntire, Marina L. (1977). The acquisition of American Sign Language hand configurations. Sign Language Studies 16:247-266.

Meier, R. P., Mauk, C., Mirus, G. R., & Conlin, K. E. (1998). Motoric constraints on early sign acquisition. 29, 63-72.

Tang, G. (2007). Hong Kong Sign Language: A trilingual dictionary with linguistic descriptions. The Chinese University Press, Hong Kong.

Wong, YO. (2008). Acquisition of handshape in Hong Kong sign language: A case study. Chinese University ofHong Kong.

Gapping vs VP-ellipsis in Catalan Sign Language (LSC).

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1. Introduction. Johnson (2014) defines gapping as being such only if the gap appears in the second conjunct of a coordination. Moreover, in English and in other spoken languages, gapping is considered a particular structure comparing it to other types of ellipsis. The main distinction is due to the restriction of gapping in appearing only in coordination (Johnson,

2014). Gapping in Catalan Sign Language (LSC), instead, presents different properties than English, showing similarity to VP ellipsis (VPE). In this paper I consider the necessity of including gapping in the same class of other elliptical structures, contrary to English. I adopt large coordination (Gengel, 2006) and PF deletion (Merchant, 2001) to analyze it. Due to the fact that English seems to represent many languages, I will be comparing LSC to it.

2. Gapping in LSC vs English. LSC, differently from English, does not respect the *no embedding constraint* (1), stated by Hankamer (1979), according to which the gapped verb can not be embedded. Being an exclusive property of gapping in English, since it does not hold for VPE (2a), Johnson (2014) uses it as a diagnostic. LSC, though, shows the same behavior in both gapping and VPE (1b, 2b), having the gapped verb embedded under THINK.

(1) a. *Alfonse stole the emeralds, and I think that Mugsy ~~stole~~ the pearls. Gapping

b. JORDI DOUGHNUT EAT MARINA SAY IX-3$_j$ MARC$_j$ CROISSANT. (LSC)

"Jordi ate a doughnut and Marina said that Marc ~~ate~~ a croissant."

(2) a. Mary ate a sandwich and I think that Mike did, too" VPE

b. JORDI DOUGHNUT EAT CAN MARINA SAY IX3$_j$ MARC$_j$ CAN ALSO. (LSC)

"Jordi can eat a doughnut and Marina said that Marc can, too."

As for the fact that gapping can only appear in coordination in English (3), this is not the case for LSC. In LSC, gapping, as also VP ellipsis, can appear also in clausal adjuncts (4). Again, gapping in LSC shows similarities to other types of ellipsis.

(3) a. *John will have caviar, although others beans. Gapping

b. John will have caviar, although others won't. VPE

(4) a. MARINA FRUIT EAT BECAUSE JORDI CAKE PALMUP. Gapping (LSC)

"Marina ate fruits because Jordi ~~ate~~ some cake."

b. MARINA FRUIT EAT CAN BECAUSE JORDI CAN ALSO. VPE

"Marina can eat fruits because Jordi can, too".

Another property of gapping that distinguishes English and LSC is wide scope negation (¬(A&B)). Johnson (2009) considers this an argument for defending low coordination in the representation of gapping in English, sincethe negation needs to scope over both conjuncts (5a). Repp (2009), though, specifies that wide scope negation in gapping can appear only in specific contexts, expressing for example denial, while the default interpretation of the scope of negation is the distributed one (¬A&¬B). LSC, though, shows the latter in cases of denial because of the obligatory presence of a polarity element in the 2_{nd} conjunct (5b).

(5) a. Kim didn't play bingo and Sandy ~~didn't~~ sit at home. ¬(A&B) (Oehrle, 1987)

b. A: YESTERDAY MARINA JORDI SEE. MARINA T-SHIRT BUY JORDI SHOES.

B: IMPOSSIBLE! IX-1 SEE MARINA JORDI. IX-3j MARINAj T-SHIRT BUY NOT JORDI SHOES *(NEITHER)! (¬A&¬B) (LSC)

A: “Yesterday I saw Marina and Jordi. Marina bought a t shirt and Jordi a pair of shoes.” B:

“It’s impossible! I saw Marina and Jordi. Marina didn’t buy a t-shirt and Jordi a pair of shoes.”

Despite the syntactic differences, English and LSC show the same discourse properties: they both express contrast which is marked by specific intonation over the remnants, and it is realized as contrastive topic over the external argument and contrastive focus over the internal one, in each conjunct (Winkler 2005). A question that can be answered by gapping involves a wh question over each argument of the verb (i.e., “Who bought what?”), which generates a set of alternatives for each argument in each conjunct. The external argument in the 1st conjunct is in contrast with the one in the 2nd one (contrastive topic) and the same holds for the internal argument (contrastive focus). In spoken languages, both arguments in each conjunct are stressed. In LSC (6), body shift orhead lean (hl) towards opposite directions in the space is present on each argument (cf. Crasborn &Van der Kooij (2013) for Sign Language of the Netherlands as well). Each constituent in the 1st conjunct is signed towards the rightside of the space and the ones in the 2nd are produced towards the left one. Breaks -between the remnants (.) mark intonational phrases. Moreover, each subject is topicalized using raised eyebrow

contralateral (right) ipsil. ipsilateral (left)

____________________hl _____hl ___________hl

________t _____t

(6) MARINA COFFEE PAY, JORDI CROISSANT.

“Marina payed for a coffee and Jordi for a croissant.”

3. Analysis. On the basis of the data presented for gapping in LSC, I suggest the need of having a large co-ordination structure (CP) that can account for distributed scope negation and also for contrastive topic and focus. This excludes then the option of considering Johnson’s (2009) analysis involving ATB movement of the verb out of vP. I will follow the general lines of Gengel’s (2006) account, which underlines the importance of representing contrast in the derivation of gapping through the movement of both arguments of the 2nd conjunct to the left periphery of the sentence, adopting Rizzi (1997). Moreover, I assume that the gapped material is deleted at PF. Applying Coppock’s (2001) analysis of gapping, based on Merchant (2001), it is possible to justify deletion.The focus condition on ellipsis (Merchant, 2001) states that a constituent a can be deleted only if a is e-GIVEN: an elided expression E has a salient antecedent A whose focus-marked parts are replaced by $-bound variables of the appropriate type through F(ocus)-closure: A entails F-clo(E), and E entails F-clo(A). E is then in mutual entailment with A since the VP of both E and A, in the case of gapping, has an open variable corresponding to the subject and one corresponding to the object to which $-type shifting applies. Looking at (6) and applying Coppock (2001), the F marked elements in the 1st conjunct are *Marina* and *coffee* (F clo(A)= xy[x pay y]) and in the 2nd conjunct *Jordi* and *croissant* (F clo(E)= xy[x pay y]). Being the F closure identical in A and E, this means that they entail each other satisfying e GIVENESS and therefore licensing deletion. Syntactically, the [E] feature that indicates the material that will be deleted at PF is placed on the head of FocP since both arguments move up to the left periphery: the subject goes to TopP passing through SpecTP and the object moves to FocP. All the material in TP can, then, get deleted. On the basis of the similarities between gapping and VPE in LSC and on the fact that VPE is also characterized by contrast between subjects, I suggest to extend the need for moving the subject to the left periphery, keeping the semanticand the rest of the syntactic analysis as proposed by Merchant (2001). The [E] feature will be in T due to the deletion of VP and not of TP as in gapping.

4. Conclusion. Gapping in LSC, differently from English, shows similarities with VP ellipsis especially because gapping in LSC can appear also in subordination. Moreover, the presence of only distributed scope negation (¬A&¬B) and the use of contrastive topic and contrastive focus require a large coordination structure, meaning CP. In order to represent gapping, I assume the need of moving the arguments to TopP and FocP followed by the deletion of TP at PF having [E] feature in the head of FocP.

Selected references.

Coppock, E. 2001. *Gapping: in defense of deletion*. Proceedings of the Chicago Linguistics Society 2001.

Gengel, K. 2006. *The Role of Contrast in Deletion Processes.* Proceedings of the PLC 30. Johnson, K. 2014. *Gapping*. Manuscript.

Merchant, J. 2001. 2001. *The Syntax of Silence: Sluicing, islands, and the theory of ellipsis.* Oxford University Press.

Repp, S. 2009. *Negation in gapping*. Oxford University Press.

Winkler, S. 2005. *Ellipsis and focus in generative grammar.* Walter de Gruyter.

High and low negation in Sign Language of the Netherlands

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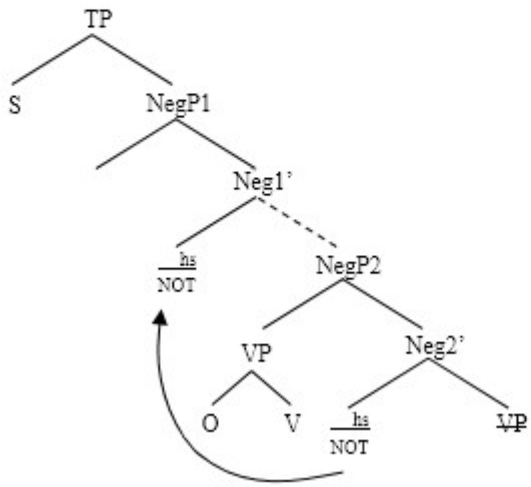
Background: In all sign languages (SLs) studied to date, clausal negation can be realized by manual negative particles and/or a non manual marker, mostly a headshake. Negative particles have been found to occupy a clause final position in many sign languages (e.g. Italian SL), but they may also precede the VP (e.g. American SL) [5,7]. SLs differ from each other with respect to whether the manual negator is obligatorily present. Previous studies revealed that SL of the Netherlands (NGT) belongs to the group of non manual dominant SLs, i.e. SLs in which clauses are commonly negated by a headshake only [3,4].

Present study: In contrast to most previous studies on SL negation [7,8], we analyze clausal negation in NGT based on naturalistic data from the Corpus NGT. Analysis of 1h 35min of data from 22 signers yielded 117 negated clauses. Of these, 48 (41%) contain the manual negator NOT, while the remaining examples are negated by headshake only, thus confirming the non- manual dominant status of NGT. Our study makes two theoretical contributions. First, by focusing only on clauses involving the negative particle, we determine that NGT employs a low and a high NegP, a pattern that has not been previously described for another SL, even though such patterns are found in spoken languages [1,6,10]. Second, based on all clauses in the data set, we offer a novel account for spreading of the headshake.

I. Negative phrases: Data analysis reveals that NOT regularly occurs in two different positions. The most frequent word order patterns in the data set are (S) (O) V Neg, i.e. clause final placement of NOT (29 cases), and (S) Neg (O) v, i.e. Pre VP placement of NOT (13 cases), see (1). The remaining 6 examples display four differentword orders and will not be considered here (note, however, that 3 of these display NOT in clause final position).

(1) a. INDEX1 POINT UNDERSTAND **NOT** (hs over UNDERSTAND NOT) [S-O-V-Neg]
'I don't understand/get the point.'

b. INDEX1 **NOT** OPINION HAVE (hs over INDEX1 NOT OPINION HAVE) [S-Neg-O-V]
'I don't have an opinion (on that).'



The different positions of NOT are reflected by the presence of two negative phrases (NegPs) in the structure on the left. We postulate that the headshake is a lexical specification of the complex negative marker NOT, which merges in the head of the lower NegP2. Building on Hagemeijer's analysis of Santome [6], we argue that the VP moves to the specifier of NegP2 in order for its negative features to be checked against Neg2. Assuming thatcriterial positions are freezing positions [9], this movement stops there. Yet, the higher NegP1 must be lexical-ized. We propose that this is achieved by subsequent movement of NOT to Neg1. The structure now contains twocopies of NOT, in Neg2 and Neg1, respectively. We further propose that this configuration is the source of the distributive properties of NOT in NGT: spell-out of Neg1 yields S-Neg-O V while spell-out of Neg2 produces S-O-V-Neg order.

The same process is at work in clauses without NOT, in which we find both (S) O V and (S) V O order. In these examples, the headshake in Neg2, being an affix, requires a lexical host and thus triggers movement of the verb out of the VP to Neg2, where it supports the headshake (cf. German and Catalan SL [8]). The remnant VP moves to [SpecNegP2] where it freezes. As is the case in sentences with the manual marker NOT, the verb in Neg2 with the headshake moves up to Neg1, and again either copy may be spelled out. In this way, both O-V and V-O order are derived.

II. Headshake: Previous studies that considered the scope of the headshake sometimes argue that its spreading is syntactically determined: it spreads over the c command domain of Neg [3,7,8]. In our data, however, the scope of the headshake varies considerably, both in examples with and without NOT. First, the verb is generally under the scope of the headshake (97% of clauses without NOT, 90% of clauses with NOT). Second, in clauses with object but without NOT, headshake accompanies preverbal objects in about half of the cases (6/11), while it almost always accompanies postverbal objects (12/13 cases; see (2a)). In examples with NOT, spreading over the preverbal object appears to be optional, at least when the VP precedes NOT (1a). Third, in all configurations, nominal subjects fall outside of the scope of the headshake, while pronominal subjects are often accompanied by a headshake (as in (1b)). Finally, sentence- final subject pronoun copies, which are frequently attested in NGT [2], are commonly marked by a headshake (2b).

(2) a. INDEX1 KNOW INDEX3 (hs over KNOW INDEX3) [S-V-O]
'I don't know that.'

b. INDEX1 EXPECT **NOT** INDEX1 (hs over EXPECT NOT INDEX1) [S-V-Neg-S]
'I didn't expect (that).'

Based on these facts, we argue that spreading of the headshake in NGT is prosodic rather than syntactic in nature. VP is a potential domain for spreading due to the structural configuration resulting from (remnant) VP-movement to [SpecNegP2]. Indeed, in clauses with NOT, both verb and object are optionally accompanied by a headshake. For clauses without NOT, our account correctly predicts that the verb is accompanied by headshake (97% of clauses). Similarly, a headshake accompanies the verb in 90% of the sentences with NOT. Our proposal also accounts for the spreading pattern observed with subjects. Pronominal subjects can be marked assuming that they are clitic heads merged in T. As such we expect interactions between Neg and T, as already shown in the literature [10]. In contrast, nominal subjects are less likely to be prosodically integrated into the rest of the clause; hence, they are not expected to be accompanied by a headshake. Crucially, spreading onto final pronoun copies can only be explained in prosodic terms, as these copies are usually taken to occupy a high (possibly right- adjoined) position in the structure; yet, they can be prosodically integrated.

Conclusion: Corpus data reveal that NGT displays considerable variation in negative clauses with respect to (i) word order and (ii) spreading of the headshake. As for (i), we showed that the different positions of the manual negator vis à vis the VP result from the presence of two NegPs which trigger V- or (remnant) VP movement, which in turn allows different spell out strategies. As for (ii), we argued that the proposed structure, while not syntactically determining the domain for spreading of headshake, does interact with spreading by definingwhich categories can host the headshake.

References:

[1] Aboh.2010. C-type negation markers on the right edge. In Topics in Kwa syntax. Springer, 109 39.

[2] Bos. 1995. Pronoun copy in SL of the Netherlands. In Sign language research 1994. Signum, 121-47.

[3] Brunelli. 2011. Antisymmetry and SLs: A comparison between NGT and LIS. PhD, UvA.

[4] Coerts. 1992. Nonmanual grammatical markers. PhD, UvA.

[5] Geraci. 2005. Negation in LIS. Proceedings of NELS 35, 217 29.

[6] Hagemeijer. 2007. Clause structure in Santome. PhD, Univ. Lisbon.

[7] Neidle et al. 2000. The syntax of ASL. MIT Press. [8] Pfau & Quer. 2002. V to Neg raising and negative concord in three SLs. Rivista di Grammatica Generativa 27: 73 86.

[9] Rizzi & Shlonsky. 2007. Strategies of subject extraction. In Interfaces+recursion = language? Mouton de Gruyter, 115–60.

[10] Zanuttini. 1997. Negation and clausal structure. OUP.

Relativization strategies in French Sign Language LSF

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Background. Relative structures are one of the key aspects of the syntax of human language because, on a pair with sentential complements and sentential adjuncts, they instantiate sentential embedding. This is one of the reasons why relativization is a well explored area in SL linguistics. Indeed, SLs instantiate the full typology of relative constructions: externally headed (DGS Pfau & Steinbach 2006, LIBRAS Nunes & de Quadros), internally headed (ASL Liddell 1980 and Wilbur & Patschke 1999, i.a.) and correlatives (LIS Cecchetto, Geraci and Zucchi 2009).

Goals. At the empirical level, i) we describe the macroscopic structure of relative constructions in LSF, ii) we documentthe typology of constituents that can be relativized and iii) we illustrate the properties of the relative markers. At the theoretical level, i) we provide a unified account of the relativization strategies, ii) we provide a strong argument for the raising analysis of relative clauses and iii) we extend the account to cases in which an entire clause is relativized (as in Adyghe, Caponigro & Polinsky 2011). Data are from two native signers of LSF. Relative constructions have been elicited with picture contin- uation tasks and other standard elicitation techniques.

(1) a. IX-1 PREFER VET $\overset{rel}{\overline{\textbf{PI}}}$ CURE DOG 'I prefer the vet that cures the dog.'

b. IX-1 PREFER VET $\overset{rel}{\overline{\textbf{PERSON-CL}}}$ CURE DOG 'I prefer the vet that cures the dog.'

c. IX-1 PREFER $\overset{rel}{\overline{\text{VET}}}$ CURE DOG 'I prefer the vet that cures the dog.'

Main strategies. LSF instantiates at least three strategies of relativization: by means of a relative marker (glossed as PI, cf. (1a)), by means of the classifier for person (like in DGS this is only for human referents, cf. (1b)), or via zero-marking (cf. (1c)). The set of nonmanuals includes: eyebrow raising, mouthing (of the relative marker) and upper body orientation towards the location of the head of the relative clause. Spreading is normally limited to the relative marker/head

Macroscopic structure. These constructions instantiate headed relative clauses with the relative marker delimiting the left periphery of the relative clause. The examples in (1) exclude correlatives because there is no fronting of the relative clause (like in English). Word order facts in object object relative clauses prove that we are dealing with externally headed relative clauses (cf. (2a)). However, we also found cases where the head remains inside the relative clause (cf. (2b)).

(2) a. IX-1 PREFER **MAN** [$_{rel}$ $\overset{rel}{\overline{\text{PI}}}$ DOG LICK ___] 'I prefer the man that the dog is licking.'

b. IX-1 PREFER [$_{rel}$ $\overset{rel}{\overline{\text{PI}}}$ **LITTLE GIRL** CURE DOG] 'I prefer the little girl that pets the dog.'

Microscopic structure. Typologically, languages differ on which constituents can be relativized along the lines defined by Lehmann's hierarchy (Lehmann, 1988):

Subject > Object > Ind.Object > ... > Adjunct

Relative clauses in LSF can be constructed over subjects (cf. (1a)), objects (cf. (2a)), adjuncts (cf. (3a)) as well as every intermediate position (not shown here). Interestingly, when the relative marker PI is at the right edge of the relative clause, as in (3b), the whole clause become the head of a relative clause and the interpretation is that of a relative clause on the entire event/situation.

(3) a. IX PREFER **TOOTHBRUSH WITH** $\overset{rel}{\overline{\text{PI}}}$ GIRL PAINT '... toothbrush the girl is painting with.'

b. IX-1 PREFER **VET CURE DOG** PI 'I prefer situations in which a vet cures a dog.'

This fact shows that PI relativizes virtually every constituent in a syntactic structure and is reminiscent of Adyghe, where sentential arguments are nominalized via relativization (Caponigro & Polinsky 2011). Externally headed relative clauses can be iterated showing the recursive power of the computational mechanism of human language. This is true also for LSF, as shown in (4):

(4) MAN STING DOG [**PI** CHASE CAT [**PI** CATCH BIRD]]
'The man stings the dog who chases the cat who catch the bird.'

Properties of the relative marker. Focusing on the relative marker PI, we have distributional evidence that it is a relative pronoun rather than a complementizer. This is shown in (5a), where PI relativizes an instrument phrase and is found along the head inside the (internally headed) relative clause, and in (5b) where the head is external but PI is stranded inside the relative clause.

(5) a. IX-1 PREFER [$_{rel}$ LITTLE GIRL **TOOTHBRUSH PI** SOAK PAINT]
b. IX-1 PREFER **TOOTHBRUSH** [$_{rel}$ LITTLE GIRL **PI** PAINT]
'I prefer the toothbrush with which the little girl is painting.'

Similarly to relative pronouns in other SLs, PI shares many features with pointing pronouns rather than with wh-pronouns. PI has the extended index handshape and directional movement (plus finger aper- ture). Directionality is toward the locus of the head of the relative clause (cf. (6a)). When the directional movement of PI does not show agreement with the head, generic readings are obtained (cf. (6b)).

(6) a. IX-1 PREFER TOOTHBRUSH$_a$ PI$_a$ GIRL PAINT '... toothbrush the girl is painting with.'
b. IX-1 PREFER VET$_a$ PI$_x$ CURE DOG 'I prefer vets who cure dogs.'

Analysis. Both the head and PI can be optionally found inside the relative clause (cf. (5a)). This fact paves the way for aunified analysis of internally and externally headed relative clauses in LSF, providing a strong argument in favor of a raising analysis.

Externally headed relative clauses are derived from underlying structures like the one in (7a). Distributional and prosodicfacts (not shown here) indicate that the head and PI occupy two distinct positions in surface structure. This can be derived either via smuggling (Collins 2005, 2006) or via two separate chains sharing the same foot (Chomsky 2008). Bothtechniques are designed to avoid minimality. We implement here the latter solution: PI is internally merged in spec,CP ofthe relative clause (cf. (7b)). The relative phrase is then remerged within a D head, creating the external head (cf. (??)). Finally a mechanism of (partial) deletion provides the surface structure (cf. (7c)). (see Sauerland 2004 for partial deletion in relative clauses).

(7) a. [$_{rel}$ ... **head PI** ...]
b. [$_{CP_{rel}}$ **head PI** [... <head PI>...]]
c. [$_{DP}$ **head** [$_{CP_{rel}}$ **~~head~~ PI** [... <~~head PI~~>...]]]

Event/situation relative clauses like (3b) are derived by merging PI in spec,CP and the entire clause into the DP (cf. (8a)). Generic readings of the kind in (6b) are derived by internal merge of the head alone into the DP, as in (8b). In these configurations agreement between the head and PI is disrupted and directionality fails to target any particular locus, nicely deriving the attested patterns.

(8) a. [$_{DP}$ [$_{rel}$ ...] [$_{CP_{rel}}$ **PI** [... <~~[$_{rel}$ ...] PI~~>...]]]
b. [$_{DP}$ **head** [$_{CP_{rel}}$ **~~head~~ PI** [... <~~head PI~~>...]]]

Conclusions. We investigated the morphosyntactic properties of relative constructions in LSF showing that they are externally headed derived from internally headed structures. During the presentation we will also show that the analysis implemented here is superior to a smuggling approach (the latter does not capture the agreement pattern in (6b and 6b)).

Selected References.

Caponigro, & Polinsky. 2011. Relative embeddings: a Circassian puzzle for the syntax/semantics interface. NLLT.

Chomsky. 2008. On phases. In Robert Freidin, Carlos P. Otero & Mara Luisa Zubizarreta (eds.), Foundational Issues in Linguistic Theory: Essays in Honor of Jean Roger Vergnaud.

De Vries. 2001. Patterns of relative clauses. Linguistics in the Netherlands 18. Lehmann.1988. On the typology of relative clauses. Linguistics 24.

WHEN BEAT IS EXCEED: VERBAL COMPARISON IN AMERICAN SIGN LANGUAGE

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BACKGROUND: Constructions expressing gradable information have received significant attention in both typological studies and formal analysis, especially in the domain of comparative constructions, where research shows systematic morphosyntactic variation in how comparison is expressed, semantic consequences of these variants, and correlations between comparatives and other properties of the grammar. Yet, few studies of comparatives exist in signed languages (but recently Aristodemo & Geraci 2015; Gajewski 2015). This gap is especially glaring in these spatially rich visual manual languages given Stassen's (1985) observation that comparatives are a domain in which spatial language is grammaticalized for other purposes. This research incorporates sign language data into the typological and formal landscape of comparatives by a) providing evidence from Deaf signers that American Sign Language (ASL) uses the spatial agreement verb BEAT to create a verbal *exceed* style comparative, and b) analyzing the morpho- syntactic and semantic properties of this comparative construction.

THE BEAT COMPARATIVE: The predicate BEAT (with an H handshape) can be used to express that the subject argument defeated the object argument in a traditionally competitive scenario (1a). However, BEAT can also be semantically extended to express general evaluative comparison between subject and object (1b), suggesting function as a grammatical comparative marker. Confirmation comes from evidence that BEAT combines with gradable predicates to create complex comparative constructions (1c). We term this and related variants BEAT comparatives.

(1)	a.	**T-R-U-M-P BEAT C-L-I-N-T-O-N**
		Trump beat Clinton [in the election].
	b.	WIN FIVE GAME BEAT WIN FOUR GAME
		Winning five games beats winning four games.
	c.	ISISTER IXi RICH(i) BEAT1 *[My] sister beats me in richness/because she is rich.*

BEAT COMPARATIVES AND COMPARATIVE TYPOLOGY: The BEAT comparative parallels well- documented cases of *exceed*-comparatives in spoken languages (2). The construction expresses information about the non-identity of two objects with respect to some graded predicative scale (Stassen 1985), as evidenced by the fact that the predicate gradability can be modified by an adverbial differential (TWICE THAN YOU, 3). The morpho-syntactic marker of comparison is a transitive verbal predicate (here, BEAT) that may be used as a main predicate (1a-b). The standard of comparison (first person in 1c) is introduced as the object argument of the comparative marker. When combined with a gradable predicate (e.g., RICH), there is argument identity between the gradable predicate and the comparative marker: in (1c), SISTER is both the property- holder of RICH and the subject of BEAT. Moreover, the relationship between the comparative marker and the gradable predicate exhibits evidence of subordination, in (1c) and (3) to (5), the gradable predicate construction is displaced to the left periphery, as is common with subordinated constructions in ASL. Morphologically, like other attested *exceed*-comparatives, BEAT comparatives express gradable information without overt degree morphology. Finally, evidence from agreement (4) shows that BEAT fundamentally establishes a relationship between individual denoting (NP) arguments, as in other *exceed* comparatives, and, thus, resists a quantity interpretation in cases like (5).

(2) Doki ya –fi rago girma

Horse it -exceed goat bigness

A horse is bigger than a goat (Hausa, Stassen 1985:43) (3) IXi FINISH SMOKE+++ BEAT TWICE THAN YOU

He smokes twice as much as you.

(4) IX2 WRITE, IXi WRITE, (i)BEAT2

(5) iBRUNO IXi READ BOOK, iEVA IXj READ BOOK, (j)BEATi

√Eva reads faster/better than Bruno.

#Eva read more books than Bruno.

Though they are underdocumented in formal literature, *exceed* comparatives are one of the most typologically common comparative structures: of 167 languages with comparison strategies documented in WALS, 20% use *exceed* comparison (Stassen 2008). That these constructions exist in sign languages (see also Costello 2015 for a comparative auxiliary, BEAT AUX, in LSE) confirms that sign languages exhibit the typological richness of spoken languages. Furthermore, analysis of the BEAT comparative also confirms the potential of sign language data to inform our typological (and formal) understanding of language. For example, such constructions are localized to South Asian and Sub Saharan languages for mysterious reasons (see Beck et al. 2009, i.a., for suggestions regarding parametric variation); thus, their existence in European- based sign languages offers new insight into the geographic distribution of comparative constructions. Additionally, the BEAT comparative is typologically *uncommon* in lexical meaning (though Stassen notes the Tamil verbal marker may be translatable as 'to leave [behind]').

BEAT COMPARATIVES AND COMPARATIVE ANALYSIS: The BEAT comparative exhibits the norm relatedness and incompatibility with crisp judgements (Gajewski 2015) characteristic of an implicit comparative (Kennedy 2007). However, it allows measure phrases as differentials (3), confirming that this is not a clearcut diagnostic (Bochnak 2013, Li 2015). Finally, BEAT is neither a comparative auxiliary (pace Costello 2015) nor a part of a serial verb construction (pace Stassen 1985). Instead, evidence suggests that it behaves as a verbal element that introduces a (reduced) clausal comparative (similar to Wolof *gën*, Baglini 2012).

References

Abner, N., R. B. Wilbur. Quantification in American Sign Language. In *Handbook of Quantifiers in Natural Language, Volume 2*. Aristodemo, V., C. Geraci. 2015. Comparatives constructions and visible degree scales in LIS. Talk presented at FEAST. Barcelona. Baglini, R. 2012. Reduced Clausal Structure in Comparatives: Evidence from Wolof. *Proceedings of BLS 38.*

Beck, S., et al. 2009. *Crosslinguistic variation in comparison constructions*. *Linguistic variation yearbook* 9(1):1–66.

Bochnak, M.R. 2013. Cross Linguistic Variation in the Semantics of Comparatives. PhD Thesis, University of Chicago.

Costello, B. 2015. Language and Modality: Effects of the use of space in the agreement system of *LSE*. PhD Thesis.

Gajewski, J. 2015. The Representation of Degree in ASL. Handout; Sign Language Meaning and Cognition Workshop. NYU. Kennedy, C. 2007. Modes of comparison. In *CLS 43.*

Li, X. 2015. The ingredients of comparison: The semantics of the excessive construction in Japanese. *Semantics & Pragmatics* 8(8):1 38. McClave, E. 2001. The relationship between spontaneous gestures of the hearing and American Sign Language. *Gesture* 1(1):51-72. Stassen, L., 1985. *Comparison and Universal Grammar.*

The Emergence of Agent-Marking Strategies in Child Homesign Systems

Laura Horton, Lilia Rissman, Diane Brentari, Susan Goldin-Meadow, TheUniversity of Chicago

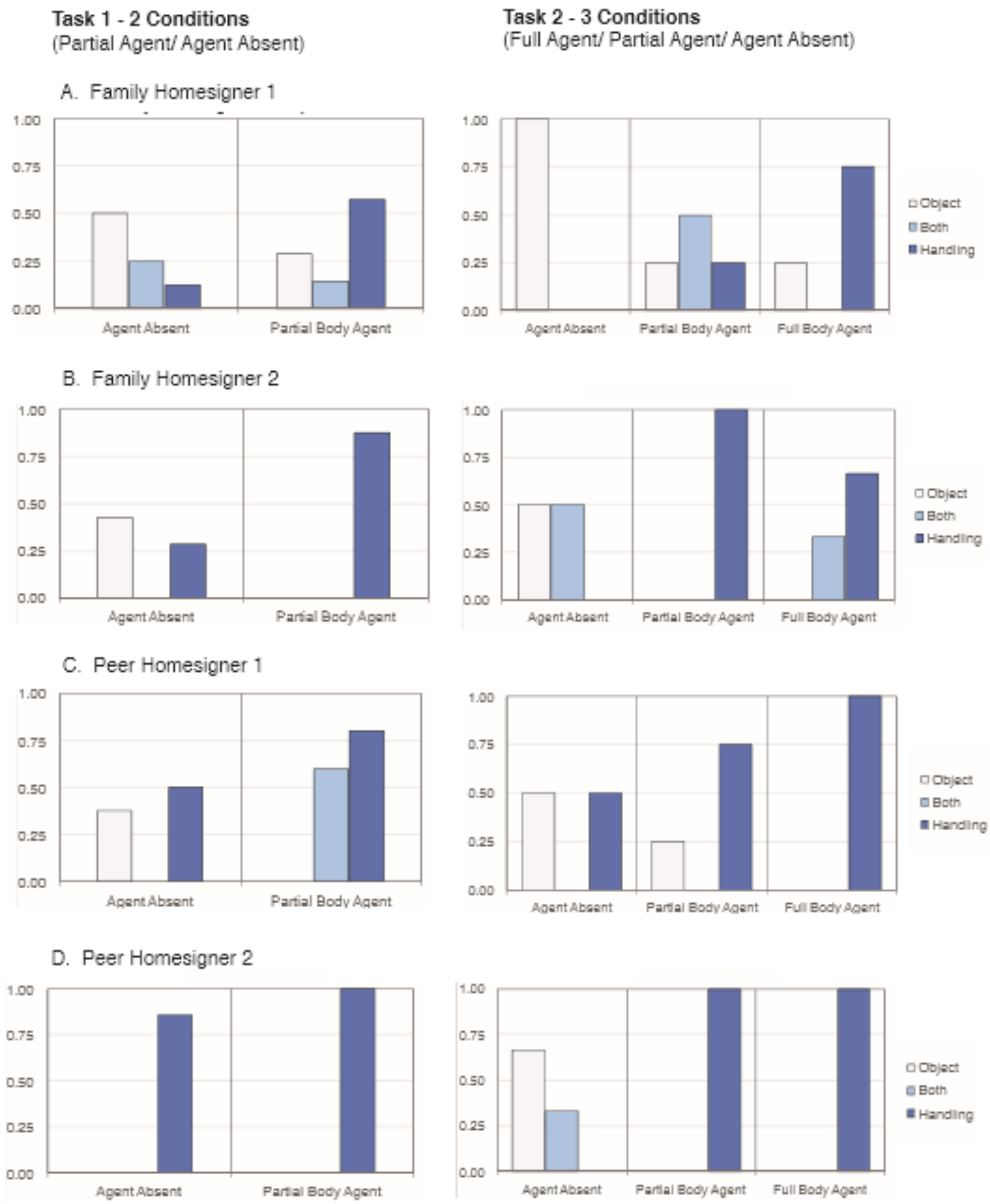
Crosslinguistically, many sign languages encode argument structure alternations with a discrete agentive morpheme in classifier predicates. Benedicto and Brentari (2004) established that, in classifier predicates in American Sign Language (ASL), handshapes that iconically represent the shape of the object, Object-CLs, and handshapes that iconically represent how a hand would manipulate the object, Handling-CLs, are sensitive to agency: Handling-CLs encode transitive agentive events. We ask whether this device appears in emergent sign language systems and whether it is used productively to encode more nuanced construals of transitive agentive events. We find that "homesigners," deaf children who are not learning an established sign language but are inventing their own sign systems to communicate, use handshape to mark a distinction between events with and without agents. Nonetheless, homesigners who communicate with each other, but have not received a structured system as input market this distinction less consistently and do not innovate devices for more nuanced construals of agency.

We compare two groups of child homesigners in Guatemala. The first group – family homesigners – has a communicative model from a deaf adult relative, who also has not learned a sign language but has significant experience using their homesign system. The second group – peer homesigners – attend school with other deaf students and thus interact with peers who also use homesign systems. We elicited descriptions of short video clips from two family homesigners (Mage = 7;0) and two peer homesigners (Mage = 12;6), evaluating whether these children mark (A) a binary distinction between events with and without an agent, and (B) a more nuanced distinction in the construal of an agentive transitive event. We used two elicitation tasks: in Task #1, participants viewed videos from two conditions: Partial Body Agent (e.g., hand puts an airplane on a table) or Agent Absent (e.g., airplane is stationary on a table). Task #2 had three conditions: Full Body Agent (e.g., person pushes over a book), Partial Body Agent (e.g., hand pushes over a book, body not visible) and Agent Absent (e.g. book falls over). In recent work on Nicaraguan Sign Language (NSL) (Rissman et al 2016), signers in Cohorts 2&3 (but not Cohort 1) use more object handshapes in Partial Body Agent than in Full Body Agent, indicating a patient-oriented construal of the Partial Body events. Each predicate in the homesigners' descriptions was glossed and coded for handshape type (handling vs. object). Each trial was categorized by response strategy: handling only, object only, or both handling and object.

All of the child homesigners mark the binary agent present/absent contrast in at least one task. The family homesigners use more handling handshapes to mark agentive events and object handshapes to mark events without an agent (Figures 1a-b), similar to established sign languages. This result is consistent with findings that handshape marks a binary agent present/absent distinction in elicited adult homesign from Nicaragua (Goldin-Meadow et al 2015) and spontaneous child homesign from the U.S. (Rissman & Goldin-Meadow 2017). Peer homesigners encode this distinction in one, but not both, tasks (Figures 1c-d). This inconsistency suggests that the emergence of this strategy may be influenced by age (child vs. adult) and context (spontaneous sign vs. elicitation).

Only family homesigners use handshape to mark a difference in construal between the Full and Partial Body Agent conditions in Task #2. Family homesigner #1, for example, uses handling handshapes for Full Body Agent events but uses both handling and object handshapes for Partial Body Agent events. The contrast between family and peer homesigners in encoding construal parallels the contrast between Cohort 2&3 signers – who received structured input - and Cohort 1 signers – who interacted with their peers, but did not have structured input. Encoding construal may require receiving a language model from an older signer and may be less likely to emerge through peer-to-peer interaction.

Figure 1. Responses for all participants (2 family homesigners, 2 peer homesigners) for Task 1 (Agent Present/Absent contrast) and Task 2 (Full Body Agent/Partial Body Agent/Agent Absent) contrast (right graphs).



References

Benedicto, E., & Brentari, D. (2004). Where did all the arguments go?: Argument changing properties of classifiers in ASL. NLL&T, 22(4), 743 810

Goldin Meadow, S., Brentari, D., Coppola, M., Horton, L., & Senghas, A. (2015). Watching language grow in the manual modality: Nominals, predicates, and handshapes. Cognition, 136(0), 381 395

Rissman, L. & Goldin Meadow, S. (2017): The Development of Causal Structure without a Language Model, LL&D

Rissman L., Horton L., Flaherty M., Coppola M., Senghas A., Brentari D. & Goldin Meadow S. (2016). Strategies In Gesture And Sign For Demoting An Agent: Effects Of Language Community And Input. EVOLANG: Proceedings of the 11th International Conference

The emergence of spatial language in Nicaraguan Sign Language: A transition from analogical to categorical forms?

Jennie E. Pyers, Wellesley College; Ann Senghas, Barnard College; Susan Goldin-Meadow, University of Chicago; Dedre Gentner, Northwestern University; Dual Language Presentation: English and ASL

Sign languages exhibit a strong preference to express spatial relations using classifier constructions that categorize primarily by object category (e.g., semantic, size and shape), rather than by relations between objects (e.g., containment, support). The spatial relations are expressed iconically by placing classifier handshapes in relation to each other, e.g., one handshape on another. Signers can alternatively use lexical locatives (also called *relational lexemes*), such as IN, ON, and, UNDER, that categorize the relations between objects, leaving out more specific information about the objects. An open question is how these lexical locative forms emerge in a sign language, whether they originate in analogical forms, and whether they are categorical in the same way that other lexical forms, like prepositions, are.

The goals our study were to: (1) document the emergence of spatial language for topological spatial relations in an emerging sign language in Nicaragua (NSL); and (2) identify whether NSL signers linguistically categorize spatial relations using the fundamental features of containment (IN) and support (ON vs. UNDER), and do so independent of the objects involved (as found in many languages, including Spanish).

In a language elicitation task, 28 NSL signers (Table 1) described 18 photos presenting pairs of objects in topological relations (Figure 1). By design, none of the pictured objects had NSL signs that use handling handshapes. We classified the type of spatial description into four categories: (1) unspecified: no spatial relation expressed, (2) analogical: a hand representing a figure was placed in relation to a hand representing a ground, (3) point: indexical point to a real spatial location, (4) lexical locative: unspecified figure and ground handshapes in relation to each other and that are used with a variety of objects.

We observed, across cohorts, a prevalence of analogical spatial descriptions. While these forms initially appear similar to classifier constructions in mature sign languages, we did not detect that the handshapes that were used classified the objects by their features. Instead, many handshapes incorporated phonological elements of the lexical sign for the referent object (Figure 3). We saw a gradual, but significant, increase in the use of lexical locative forms across cohorts (p=.02; Figure 4). Additionally, we observed the emergence of lexical locatives labeling *in* relations before those labeling *on* or *under* (Figure 5). We are currently exploring whether the phonological form of the lexical locatives is a reduction of the analogical constructions used by all cohorts, is derived from the NSL verbs for ENTER and PUT, and/or drawn from frequent gestures used by hearing Nicaraguans.

We suggest that the more specific analogical forms emerged first to express topological relations with highly specific figure and ground information. After this step, signers may have generalized across these analogical forms to arrive at categorical linguistic constructions for spatial relations.

Table 1. Participant characteristics

	N	Females (#)	Mean Age (*SD*)
First cohort	10	4	40.81 (3.86)
Second cohort	10	5	30.30 (1.97)
Third cohort	8	5	21.11 (1.47)

Figure 3. Analogical construction describing a pen under a ladder; the sign uses a generic ground handshape with a figure handshape borrowed from the NSL sign PEN.

Figure 2. Sample Elicitation Item: Signers describe the picture outlined in red.

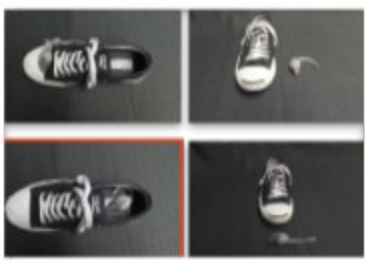


Figure 4. Average proportion of spatial language types produced by each cohort. Lexical increased across cohorts

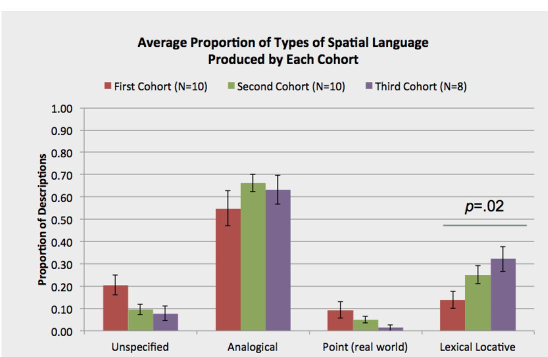
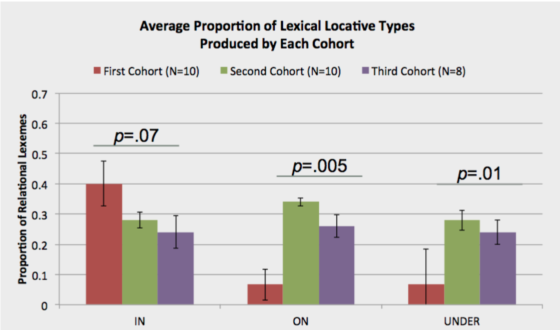


Figure 5. IN appeared and in the first cohorts; ON and UNDER appeared in the second and third cohorts



Digging up the core features of (non)restrictiveness in sign languages relative constructions

Chiara Brancini

In recent years, a growing number of studies has investigated the equivalent of relativization strategies in sign languages (see Pfau and Steinbach 2005 for DGS; Cecchetto et al. 2006, Branchini and Donati 2009 for LIS; Tang and Lau 2012 for HKSL; Mosella 2011, 2012 for LSC; Galloway 2012, 2013 for ASL; Kubuş 2014 for TİD, a.o.) showing that they exhibit the same variation attested in spoken languages.

As for the syntactic typologies of relativization, sign languages have been reported to display internally-headed relative clauses (IHRCs), externally-headed relative clauses (EHRCs), free relatives and correlatives.

A more unbalanced picture emerges when looking at their semantic interpretation: the vast majority of the literature on sign languages reports on and describes relative constructions yielding a restrictive interpretation.

On the one hand, this allows for a cross linguistic, within modality comparison in search of markers of restrictiveness shared by sign languages and, on the other hand, it opens to a cross linguistic comparison with spoken languages in search of a cross modality equivalence in the domain of restrictive relative clauses (as the use of determiner like elements univocally identifying the head of the relative clause and potentially endowing it with nominal features, specific prosodic properties, and so on).

Up to now, very few studies (see Happ and Vorköper 2006 for DGS EHRCs; Cecchetto et al. 2006 for LIS correlatives; Kubuş 2014 for TİD EHRCs) have reported a nonrestrictive interpretation for relative constructions in sign languages.

The investigation on the equivalent of nonrestrictive relative clauses looks, however, crucial, not only to reach abetter understanding of this peculiar syntactic construction (on which no consensus has been reached in the literature yet), but also to understand its semantic opposite, namely restrictive relative clauses and the way in which the core syntactic properties restrictive and non restrictive relative clauses display are directly mirrored in their structural representation.

The talk will first review the main findings of the literature on relativization in sign languages by underlying theshared syntactic features of restrictive relative clauses and by describing some proposals advanced for their structural derivation. Data on the equivalent of non restrictive relative clauses in Italian Sign Language will thenbe presented and their core features discussed. Through the comparison between restrictive and non restrictive relative clauses, the talk will attempt at identifying the core features of (non)restrictiveness suggesting that the superficial differences observed in the two types of constructions are directly linked to their different structural representation: thematic selection of the relative CP by a D head in restrictive relative clauses vs. adjunction of the relative CP to the external NP head in non-restrictive relative clauses.

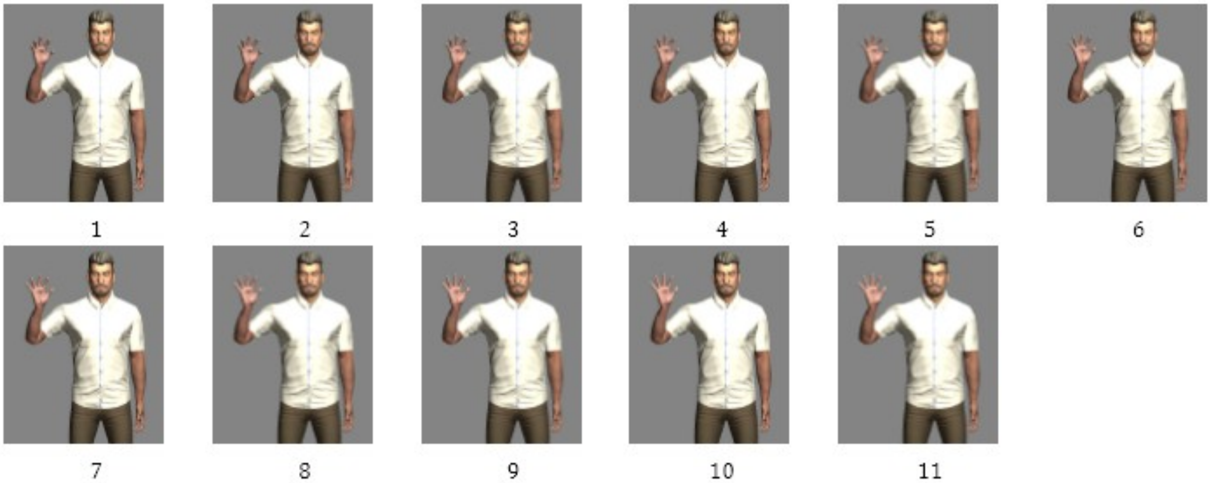
The Perception of Handshapes in Hong Kong Sign Language (HKSL)

Wen-jing ZHAO, Zi-yi PAN, Gladys TANG

Categorical perception (CP) is a psychophysical phenomenon in which certain tokens in a continuum of stimuli are perceived categorically rather than continuously (Liberman et al., 1967). In spoken language, CP is subject to language specific effect for some phoneme contrasts as /r/-/l/ in English (Miyawaki et al.,1975; Iverson et al., 2003) while for others (i.e. /p/ - /b/), CP is language independent (Eimas et al., 1971; Kuhl & Miller, 1975). Also, English and cross-language studies indicate that the level of CP is not consistent across types of phoneme contrasts. For instance, CP effect is the strongest in voiced stop consonants (Jonisse, Zevin & McCandkiss, 2007) followed by fricatives (Lago et al., 2015). Vowel contrasts are perceived least categorically (Repp, Healy & Crowder, 1979; Stevens et al., 1969).

Studies on sign language handshape perception aim at understanding whether CP is a language-dependent (domain-specific) or language-independent (domain-general) phenomenon. Yet, previous findings are rather controversial. Studies conducted by Emmorey et al., (2003) and Baker et al., (2005) showed a better discrimination across category handshape boundaries in the perception of ASL for deaf native signers over hearing non-signers, though both groups identified the handshape contrasts categorically. However, other studies found no CP effect in the above groups (Newport, 1982), and across deaf native, deaf non-native (L2) and hearing non-native (L2) signers (Morford et al., 2008). Morford et al. (2008) further argued that between-group variability in the discrimination task was due to native signers' less sensitivity to within-category than cross-category contrasts. Following Morford's study, Best et al. (2010) added one more hearing non-signers group and found results similar to Morford et.al's. They suggested that the only difference in just one phonetic feature might have resulted in the lack of CP effects in their and earlier studies. Therefore, CP effects could be found when handshape contrasts involve multiple articulatory differences.

From a more sign linguistic view, the current study aims to further explore 1) whether language experience plays a role in the perception of HKSL handshapes and 2) whether different phonetic features in handshape yield different CP effect. Groups of 10 deaf native signers, 10 hearing non-native signers and 10 hearing non-signers are included in the study. According to Brentari's Prosodic Model (1998), the selected fingers node branches into joints and fingers1. Features dominated by both joints and fingers1 determine the actual realization of the handshape. Therefore, the current study also investigates whether certain features (joints flexion and finger point of reference) influence CP effect. A forced choice identification task and an ABX discrimination task are designed on two sets of handshape contrasts varying in selected finger point of reference ([middle] vs. [ulnar]) controlled over selected finger quantity and joints flexion ([base & non-base flexed] vs. [extend]). Each set of stimuli includes one continuum of two contrastive handshapes (e.g. fingers1: N vs. P ; joints:) vs. >) Each continuum contains 11 still pictures paced evenly between two handshape endpoints. Preliminary results show that language experience alters the perception of HKSL handshape contrasts proved by the lack of CP by hearing non-signers compared with deaf natives and hearing non-native signers. Also, a more robust CP effect is found for fingers1 contrasts than joints contrasts suggesting that fingers1 features pose greater perceptual saliency when compared with joints features. In a follow up study, a set of dynamic video stimuli are under development to testify whether perception results remain the same.



Example: continuum of joints flexion contrasts YELLOW (base & non-base flexed) vs. HAND (extend)

References:

Baker, S. A., Idsardi, W. J., Golinkoff, R. M., & Petitto, L. A. (2005). The perception of handshapes in American Sign Language. *Memory & Cognition*, 33, 887-904. Best, C.T., Mathur, G., Miranda, K.A., Lillo Martin, D. (2010) Effect of sign language experience on categorical perception of dynamic ASL pseudosigns. *Attention, Perception & Psychophysics*, 72(3), 747-762.

Brentari, D. (1998). A prosodic model of sign language phonology. Cambridge, Mass.: MIT Press. Eimas, P.D., Siqueland, E.R., Jusczyk, P., & Vigorito, J. (1971). Speech perception in infants. *Science*. 171, 303-306.

Emmorey, K., McCullough, S., & Brentari, D. (2003). Categorical perception in American Sign Language. *Language & Cognitive Processes*, 18, 21-45.

Iverson, P., Kuhl, P.K., Akahane Yamada, R. (2003) A perceptual interference account of acquisition difficulties for non-native phonemes. *Cognition*, 87(1):B45-B57.

Jonisse, M., Zevin, J., & McCandliss, B. (2007). Brain mechanisms implicated in the preattentive categorizationof speech sounds revealed using fMRI and a short interval habituation trial paradigm. *Cerebral Cortex*, 17, 2084-2093.

Kuhl, P.K. & Miller, J.D. (1975). Speech perception by the chinchilla: Voiced-voiceless distinction in alveolar plosive consonants. Science, 190, 69-72.

Lago, S., Scharinger, M., Kronrod, Y., & Idsardi, W.J. (2015). Categorical effects in fricative perception are reflected in cortical source information. *Brain & Language*, 143,52-58.

Liberman, A.M., Cooper, F.S., Shankweiler, D.S. & Studdert-Kennedy, M. (1967). Perception of the speech code. *Psychological Review*, 74, 431-461.

Miyawaki, K., Strange, W., Verbrugge, R., Liberman, A.M., Jenkins, J.J., Fujimura, O. (1975). An effect of linguistic experience: The discrimination of [r] and [l] by native speakers of Japanese and English. *Perception & Psychophyscis,* 18,331-340.

Morford, J., Grieve-Smith, A., MacFarlane, J., Staley, J., & Waters, G. (2008). Effects of language experience on the perception of American Sign Language. *Cognition*, 109, 41-53.

Newport, E. (1982). Task specificity in language learning? Evidence from speech perception and American Sign Language. In E. Wanner & L. Gleitman (Eds.), Language acquisition: The state of the art (pp. 450-486). Cambridge: Cambridge University Press.

Repp, B.H., Healy, A.F., & Crowder, R.G. (1979). Categories and context in the perception of isolated steady-state vowels. *Journal of Experimental Psychology: Human Perception & Performance*, 5, 129-145.

Stevens, K.N., Liberman, A.M., Öhman, S.E.G., & Studdert Kennedy, M. (1969) Crosslanguage study of of vowel perception. *Language & Speech*. 12, 1-23.

The dominant and non-dominant hand movement in Slovenian Sign Language locative constructions

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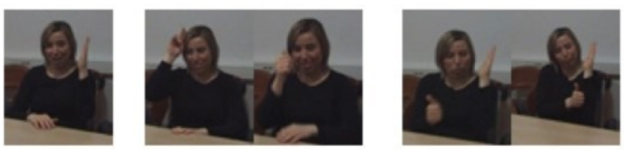
1 Introduction

In sign languages, signers habitually encode the relations between locative arguments with a complex predicate consisting of several independent morphemes, as shown by Pfau and Aboh (2012) for Sign Language of the Netherlands. In this study, I discuss the direction and composition of locative movement in Slovenian Sign Language (SZJ), distinguishing it from the movement of non-locative predicates in this language. This distinction gives support to the original distinction between agreeing and spatially agreeing predicates that was first suggested for American Sign Language (ASL) by Padden (1983).

2 Data

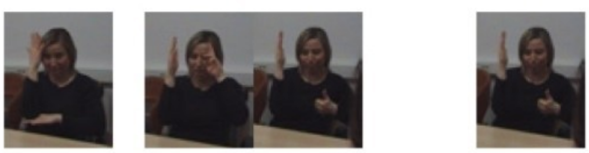
SZJ locative constructions were elicited from six native deaf signers, aged 25 to 60. In Picture Description Task (Volterra et al. 1984: PDT) they were shown photographs of still life (which are printed to the right of the examples) one by one on a computer screen and were asked to describe the depicted situations to the interpreter/deaf co-signer. In a follow-up Grammaticality Judgements Task (GJT) they discussed each other's utterances.

3 The non-dominant hand movement as a measure phrase

(1)



TREE_a BOY $\text{CL}(1)_b$ *r:* CL(TREE)_a / *l:* $_b\text{BE-LOCATED-CL}(1)_a$ Stimulus

'Someone is next to a/the tree to the left.'   (SZJ; loc25n)

(2)



TREE_b *r:* CL(TREE)_b / *l:* BOY $\text{CL}(1)_a$ *r:* $_b\text{BE-LOCATED-CL(TREE)}_c$ / *l:* $_a\text{BE-LOCATED-CL}(1)_c$ Stimulus

'A/the boy is near a/the tree to the right.'   (SZJ; loc22n)

(3)

$\overline{\text{BALL}_a}^{\text{re}}$ PENGUIN   *r:* $_b\text{BE-LOCATED-CL}(2)_a$ / *l:* CL(B)_a Stimulus

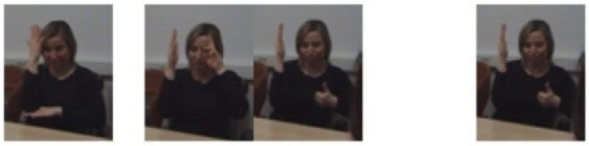
'A/the penguin stands on a/the ball.'   (SZJ; loc11n)

(1)

TREE$_a$ | BOY CL(1)$_b$ | r: CL(TREE)$_a$ l: $_b$BE-LOCATED-CL(1)$_a$ | Stimulus

'Someone is next to a/the tree to the left.' (SZJ; loc25n)

(2)



TREE$_b$ | r: CL(TREE)$_b$ l: BOY CL(1)$_a$ | r: $_b$BE-LOCATED-CL(TREE)$_c$ l: $_a$BE-LOCATED-CL(1)$_c$ | Stimulus

'A/the boy is near a/the tree to the right.' (SZJ; loc22n)

(3)

$\overline{\text{BALL}_a}^{\text{re}}$ | PENGUIN | r: $_b$BE-LOCATED-CL(2)$_a$ l: CL(B)$_a$ | Stimulus

'A/the penguin stands on a/the ball.' (SZJ; loc11n)

In SZJ, locative predicates are habitually carried out by two independent classifier handshapes. The dominant hand (H1) refers to the Figure while the optional non-dominant hand (H2) refers to the Ground. The word order is Ground-Figure-Predicate.

In (1), the H1 moves towards the Ground and covers the full distance on the relevant geometrical axis in order to reach the Ground – while the H2 is stationary. There is no gap left in between the H1 and H2 after H1 comes to a hold at the end of the predicate. The utterance encodes the spatial configuration of a Figure being at/next to the Ground. In (2), the H1 is directed away from the Ground – while the H2 keeps the distance by moving along in the same direction as H1. There is a gap left between the H1 and H2 after they come to a hold at the end of the predicate. The distance between the hands encodes the configuration of Figure being at the certain distance to the Ground, which I analyse as a measure phrase comparable to those in oral languages (Svenonius 2008). In (3), however, there is a gap left between the hands after the end of the movement – although the utterance refers to the situation where there is no distance between the Figure and the Ground. This is evident from the stimulus picture and is also a matter of common sense: penguins usually do not float in the air above balls. But, what is the difference between (2), where there is a distance between the Figure and the Ground (and a measure phrase is present in the construction), and (3), where there is no distance between the Figure and the Ground (and a measure phrase is not present in the construction)? The key to this answer is the direction of movement and the behaviour of the H2. In (2), but not in (3), the H2 is not stationary so that both H1 and H2 move. Furthermore, they both move in the very same direction – away from the Ground. Finally, according to my informants' intuition, verified with GJT, a configuration in which a Figure and a Ground are not on one and the same geometrical axis (either x, y or z) is not possible to encode with a stative locative classifier predicate in SZJ.

4 Conclusion: regular vs. spatially agreeing verbs

I conclude that, with respect to the movement subcomponent, there are two differences between the regular and spatially agreeing predicates in SZJ. Non-locative predicates connect just any r(eferential)-loci in signing space while locative predicates can only connect two r-loci on the same geometrical axis. Furthermore, the movement of locative predicates consists of two components: compulsory H1 movement and optional H2 movement:

- If H1 is directed towards the Ground's r-locus, H2 does not move and the measure phrase is not realised. This way, the meanings 'on' and 'under' (y axis), 'at the right' and 'at the left' (x axis) and 'in front of' and 'behind' (z axis) are encoded.
- If H1 is directed away from the Ground's r-locus, H2 moves along with H1 and the measure phrase is realised. This way, the meanings 'this distance above' and 'this distance below' (y axis), 'this distance to the right of' and 'this distance to the left of' (x axis) and 'this distance in front of' and 'this distance behind' (y axis) are encoded.

References

Padden, C. (1983). Interaction of Morphology and syntax in American Sign Language. Ph. D. thesis, University of California, San Diego.

Pfau, R. and E. O. Aboh (2012). On the syntax of spatial adpositions in sign languages. In Proceedings of IATL, Volume 68 of MIT Working Papers in Linguistics, Camdridge, MA, pp. 83_104. MIT Press.

Svenonius, P. (2008). Projections of P. In A. Asbury, J. Dotlacil, B. Gehrke, and R. Nouwen (Eds.), Syntax and Semantics of Spatial P. Amsterdam: Benjamins.

Volterra, V., A. Laudanna, S. Corazza, E. Radutzky, and F. Natale (1984). Italian Sign Language: the order of elements in the declarative sentence. In F. Loncke, P. Boyes-Braem, and Y. Lebrun (Eds.), Recent research on European Sign Languages, pp. 19_48. Lisse: Swets and Zeitlinger.

NULL ARGUMENTS, AGREEMENT, AND CLASSIFIERS IN RSL

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Whether a language allows null arguments has been connected to the presence of rich agreement, as in Italian [1], and to the absence of agreement, as in Chinese [2]. Sign languages present a unique testing ground for null argument theories, because they have both agreeing and non-agreeing verbs. It has been shown that ASL has two types of null arguments: licensed by agreement in agreeing verbs (syntactic pro-drop), and licensed by topics (discourse pro-drop) with plain verbs [3] (but see [4] for an alternative analysis). It was later discovered that classifier predicates license null arguments in DGS [5] and NGT [6], which has been used an argument for analyzing classifiers as agreement. In this paper we present novel data from Russian Sign Language (RSL) that questions both the connection between null arguments and agreement and the analysis of classifiers as agreement markers.

RSL is clearly a null argument language; in natural discourse most arguments expressing given information are omitted [7]. It can be argued that this manifests discourse pro drop: a (null) topic allows a coreferent argument within the clause to be null. Crucially, in contexts where the topic licensing is impossible, pro-drop with plain verbs is not allowed. In (1a) the topic of the last clause is overt (BOY IX-B) and not co-referent with the null object (the book); it serves as intervener between the co-referent topic BOOK IX-A and the *pro*, so the sentence is ungrammatical. Note that the same sentence with a pronoun is grammatical (1b).

	______top	____top
(1)	a. *[BOOK IX-A]*i* MAN THINK	BOY IX-B BUY *t*i

	top	top
	b. [BOOK IX-A]$_i$ MAN THINK	BOY IX-B BUY IX-A$_i$

‘This book, the man thinks that the boy bought it.’

In contrast to other sign languages, however, agreeing verbs in RSL do not allow for object pro-drop in contexts where topic licensing is impossible. In (2a) the verb SEE-A shows agreement with the object (the book), but the null object is still ungrammatical; a resumptive pronoun should be used as in (2b). Subject pro-drop in such contexts is also prohibited for both plain and agreeing verbs.

top		**top**
(2) a. *[BOOK IX-A]$_i$ **top**	MAN THINK	BOY IX-B SEE-A t_i top
b. [BOOK IX-A]$_i$	MAN THINK	BOY IX-B SEE-A IX-A$_i$

‘This book, the man thinks that the boy saw it.’

Finally, classifier predicates do allow pro-drop in contexts where topic-licensed pro-drop is impossible. Null arguments are allowed with both whole-entity classifier predicates (3a) and handling classifier predicates (3b). Note that in both examples there is an intervener between the potential licensing topic and the *pro*, similar to (1) and (2).

top

(3) a. [BOOK IX-A]$_i$ BOY THINK t_i SHELF CL$_{WE}$(B)-BE.AT

‘This book, the boy thinks it is on the shelf.’

top top

b. [BOOK IX-A]$_i$ BOY THINK IX-B MAN t_i CL$_{HL}$(bC)-PUT SHELF CL$_{HL}$(bC)-PUT

‘This book, the boy thinks it is on the shelf.’

It appears that there is no theory of null argument licensing in the literature that could explain the RSL facts and at the same time account for the contrasting facts in ASL, DGS, and NGT. There are two issues that need to be explained: (1) Why is pro-drop not licensed by agreeing verbs in RSL? (2) Why is pro-drop nevertheless licensed by classifier predicates in RSL?

As for the first question, for spoken languages it has been shown that not all types of agreement licenses pro-drop; languages with non-rich agreement do not allow it. However, there is no consensus of what qualifies as non-rich agreement. Some argue that if verbal forms are stored in the lexicon and not productively constructed pro drop is not allowed [8], and others that agreement is meager when morphological impoverishment takes place [9]. These explanations are clearly not applicable to agreement in RSL: different forms of agreeing verbs cannot be stored due to a potentially infinite number of such forms, and there is no evidence of impoverishment.In general, it is not clear whether agreement in RSL is morphologically different from agreement in ASL, DGS and NGT. This question awaits further research.

As for the second issue, we suggest that classifier predicates behave differently from agreeing verbs because classifiers are not agreement markers. One argument against treating them as agreement markers is that the form of the classifier is not always determined by the Theme argument, but pro drop of this argument is still possible. Consider (4): the classifier predicate CL$_{HL}$(B)PUSH expresses the meaning ‘push with the back of the hand’, and the shape of the hand is not determined by the object being pushed (the cup, which would otherwise be referred to by a C-handshape), but by the shape of the hand itself making the pushing action. Nevertheless, the null expression of the Theme object (the cup) in the final clause is possible.

      top   top

(4) [CUP IX-A]$_i$ BOY THINK   MAN IX-B t_i CL$_{HL}$(B)-PUSH

'This cup, the boy thinks that the man pushed it with the back of his hand.'

Since classifiers are not agreement markers, classifier predicates in RSL do not pattern with agreeing verbs with respect to pro drop. These predicates do however pattern with another construction, namely with role shift. Our analysis of corpus data has shown that omitting the argument that introduces role shift is allowed even in the context of topic shift, in other words, where topic licensing of argument omission is not possible, also with plain and agreeing verbs. In (5) the argument introducing the second role shift (the people who are calm) is missing, although it is different from the argument introducing the shift before. The presence of role shift makes this null subject possible.

        rs   rs

(5) t_i #URGENTLY. t_j CALM

'[I say:] do it urgently! They are calm.' [RSL s2-s16]

Role shift and classifier predicates have a property in common: they both involve demonstration [10]. We hypothesize that argument omission observed in RSL is in fact licensed by the presence of demonstration. Demonstration means switching from a language mode to a partially depictive mode; the signer does not (only) express a proposition, but also demonstrates a related event. This relaxes grammatical constraints, such as obligatoriness of overtly expressing arguments: the proposition might be defective in the absence of all arguments, but this defectiveness is accepted in the context of demonstration. Demonstration clearly allows for violations in phonology (e.g. the symmetry conditions can be violated in classifier predicates), so it is not surprising that other parts of the grammar are also affected.The conclusion is that what we have been calling pro drop in the context of classifier predicates and role shift is not a grammatical phenomenon per se, but an effect of these structures being on the boundary between grammar and non-grammatical periphery.

References:

[1] Rizzi 1986. Null Objects in Italian and the Theory of pro. *Linguistic Inquiry* 17, 501–557.

[2] Huang 1984. On the Distribution and Reference of Empty Pronouns. *Linguistic Inquiry* 15, 531–574.

[3] Lillo- Martin 1986. Two Kinds of Null Arguments in American Sign Language. *Natural Language & Linguistic Theory* 4, 415–444.

[4] Koulidobrova 2011. Null objects in ASL: A case of (bare) NP drop. Manuscript. UConn.

[5] Glück & Pfau 1998. On Classifying Classification as a Class of Inflection in German Sign Language. "*Console VI" proceedings,* 59–74.

[6] van Gijn & Zwitserlood 2006. Agreement Phenomena in Sign Language of the Netherlands. In *Agruments and agreement,* 195–229.

[7] Kimmelman 2015. Topics and topic prominence in two sign languages. *Journal of Pragmatics* 87, 156–170.

[8] Speas 2006. Economy, agreement, and the representation of null arguments. In *Agruments and agreement,* 35–75.

[9] Müller 2014. Pro Drop and Impoverishment. In *A Festschrift Presented to Günther Grewendorf on Occasion of His 60th Birthday*, 93–116.

[10] Davidson 2015. Quotation, demonstration, and iconicity. *Linguistics and Philosophy* 38, 477–520.

Iconic Plurality in ASL

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Goals: We argue that repetition based plurals in ASL (involving 'unpunctuated repetitions' of a noun; see Steinbach & Pfau 2006, Coppola et al. 2013) can come with a rich, at issue iconic component whereby the geometric arrangement (and number) of repeated occurrences provide information about the arrangement (and size) of the denoted plurality. The shape of the plural may suffice to introduce new singular discourse referents when a vertex can be inferred to denote a singular object, which yields a remarkable interaction between iconic semantics and standard logical semantics. We show that our analysis extends to 'punctuated' repetitions, which involve clearly individualized iterations of a singular noun. While these may initially look like coordinated indefinites, they are better handled by the same iconic framework as plural, unpunctuated repetitions. Some repetition based mass terms also give rise to iconic effects, and to different readings depending on whether the repetition is continuous, unpunctuated, or punctuated, which can be explained by our analysis. These facts highlight the need for a formal semantics with iconicity for sign language.

Playback method: Data were elicited through repeated quantitative acceptability judgments (7 point scale, with 7=best) and inferential judgments obtained from a Deaf native signer of ASL (of Deaf, signing parents).

At issue contribution of iconic enrichments: (1) contrasts a horizontal and a triangular arrangement of the repetitions of *TROPHY*, both punctuated and unpunctuated. The shape as well as the number of repetitions trigger truth-conditional differences within the conditional. This is suggestive of an at-issue contribution. *Notation:* -rep =unpunctuated repetition;-cont = continuous repetition;N N N = 3 punctuated repetitions of N.

(1)

Context: The speaker will be renting the addressee's apartment; he knows it contains trophies, but he hasn't seen them. (ASL, 32, 0096, **4 judgments**)

POSS-2 APT IF HAVE ________, IX-1 ADD 20 DOLLARS.

'If you apartment contains ____ trophies, I'll add $20 to the rent.' a. 7 [TROPHY TROPHY TROPHY]horizontal

=> if there at least three trophies in a horizontal line, $20 will be added. Precise condition about numbers: no hesitation for the 'exactly 3' condition

b. 7 [TROPHY TROPHY TROPHY]triangle

=> if there at least three trophies forming a triangle, $20 will be added. Precise condition about numbers: no

hesitation for the 'exactly 3' condition c. 7 TROPHY-rep-3horizontal

=> if there at least three or four trophies in a horizontal line, $20 will be added. Vague condition about numbers:

explicit *un*certainty for the 'exactly 3' condition (2/4 judgments)

d. 6.7 TROPHY-rep-3triangle

=> if there are at least 3 trophies forming a triangle, $20 will be added. Explicit uncertainty if there is a large

number of trophies in a row (4/4 judgments)

e. 6.7 TROPHY-rep-≥4-horizontal

=> if there at least three or four or five trophies in a horizontal line, $20 will be added. Vague condition about numbers: explicit uncertainty for the 'exactly 3' (2/4 judgments) and 'exactly 4' (1/4 judgments) conditions

f. 6.5 TROPHY-rep-≥4-triangle

=> if there are at least three or four or five trophies forming a triangle, $20 will be added. Vague condition about numbers: explicity uncertainty for the 'exactly 3' (2/2 judgments) and 'exactly 4' (1/4 judgment) conditions. Explicit uncertainty if there is a large number of trophies in a row (3/4 judgments).

Initial account: Punctuated repetitions as in (1)a b may initially seem to be conjoined indefinites involving iconic conditions (we revise this below). Unpunctuated repetitions in (1)c f seem to be *bona fide* (optional) plurals, but with iconic conditions, hence the modified analysis in (2), with iconic conditions boldfaced.

(2) [[TROPHY-repX F]]c,s = true iff for some object d, *[[TROPHY]](d) = true **and *TROPHY-repX* iconically represents d given c** and [[F]]c, s[X→d] = true (where * is Link's sum closure operator, e.g. Nouwen 2015) , iff for some group of trophies d, ***TROPHY-repX* iconically represents d given c** and [[F]]c, s[X→d] = true

Interaction with anaphora - the Edge Effect: (2) misses the fact that iconic plurals can create discourse referents at their edges. Specifically, if an iconic representation r denotes group d, if one can infer on iconic grounds that a part r' of r denotes a subgroup d' of d, then *r' becomes available as a new discourse referent for anaphoric purposes.* This happens at edges (vertices) of representations, presumably because they are iconically more fine grained than non edges. Thus anaphoric pointing to the middle of a row, as in (3)c, is degraded relative to pointing to the top, central vertex of a triangle, as in (3)d. In addition, (3)d yields a clear singular reading (='top trophy'), whereas (3)c preferably yields a plural reading (='all trophies').

2

(3) YESTERDAY IX-1 VISIT POSS-2 APT. IX-1 SEE TROPHY-rep-__ . POSS CARVE WORDS FUNNY.

'Yesterday, I visited your apartment. I saw several trophies, arranged in a __. The inscription of … was funny.'

–POSS targets the left-most *TROPHY:*

a. 6.5 -rep-3horizontal

_____ = row; …… = the left-most trophy

b. 6.5 -rep-3triangle

_____ = triangle; …… = the left-most trophy

–POSS targets the intermediate *TROPHY:*

c. 5.2 -rep-3horizontal

_____ = row; …… = all trophies / the intermediate trophy

=> unclear meaning: all the trophies are funny (3/4 judgments) or the intermediate trophy is (4/4 judgments)

d. 6.2 -rep-3triangle

_____ = triangle; …… = the top trophy

=> clear meaning: the top trophy was funny

–POSS targets the right-most *TROPHY:*

e. 6.5 -rep-3horizontal

_____ = row; …… = the right-most trophy

f. 6.5 -rep-3triangle

_____ = triangle; …… = the right-most trophy (ASL, 32, 0084; **4 judgments**)

Extension to punctuated repetitions: The data in (4) contrast unpunctuated and punctuated repetitions co-occurring with numerals. The acceptability of the boldfaced (4)f,h is completely surprising if these are just conjoined singular indefinites. We propose that they too are plurals, but that *as a default* (and only as a default) iconic conditions guarantee that *TROPHY TROPHY TROPHY* denotes a group of 3, spread out trophies. Correspondingly, with punctuated but not unpunctuated repetitions, the trophies must be spread out.

(4) MUSEUM HAVE

a. 7 TROPHY-rep.

b. 7 TROPHY TROPHY TROPHY. e. 6.7 4 TROPHY-rep.

f. 7 **4 TROPHY TROPHY TROPHY**. => the trophies are spread out g. 7 10 TROPHY-rep.

h. 7 **10 TROPHY TROPHY TROPHY**. => the trophies are spread out (ASL 34, 2216; **3 judgments**)

Final account: (5) summarizes our rule, where *TROPHY-iterX* is a repetition introducing plural variable *X*:

(5) For *TROPHY-iterX* = *TROPHY-repX* or *[TROPHY TROPHY TROPHY]X* (i.e. unpunctuated or punctuated), [[TROPHY-iterX F]]c,s = true

iff for some plural object d, *[[trophy]]c, s[X→d](d) = true **and *TROPHY-iterX* iconically represents d given c** and [[F]]c, s[X→d, x1→d1, …, xn→dn] = true, where *x1, ..., xn* are discourse referents made available by the iconic semantics of *TROPHY-iterX* with respectively denotations d1, …, dn (which are parts of d),

iff for some group of trophies d, ***TROPHY-repX* iconically represents d given c** and [[F]]c, s[X→d, x1→d1, …, xn→dn] = true.

Iconic conditions will be responsible for ensuring that in default cases punctuated repetitions denote groups that include the same number of objects as are present in the repetition – but this may overridden, as in (4).

Extension to some mass terms: We argue that some mass terms such as *SALT, OXYGEN, PEE* but not others such as *FLOUR* allow for continuous repetitions that come with iconic readings, as in (6)d,f.

(6) SCIENCE LAB TRIANGLE_triangular_shape YESTERDAY BRIEF LEAK NOW FINISH REPAIR. BUT NOW STILL HAVE

a. 7 SALT (neutral)

b. 7 FLOUR (neutral)

c. 7 SALT-continuous, occupying the left-most part of the triangle => half of the triangle filled with salt d. 4.5 FLOUR-continuous, occupying the left-most part of the triangle

e. 6.7 SALT-continuous, occupying all of the triangle => all of the triangle filled with salt

f. 4.5 FLOUR-continuous, occupying all of the triangle (ASL, 33, 0128; 4 judgments)

PEE is a particularly interesting example because it is a mass noun which is phonetically identically to *TOILET* (= a trembled manual *T*), except for the mouthing. Besides giving rise to continuous repetition, *PEE* also allows for discontinuous repetition, in which case one gets a mixed plural/mass reading involving several areas of pee. We will argue that this follows from an extension to mass terms of the analysis in (5).

Poster abstracts

Automatic use of phonological codes during word recognition in deaf signers of Spanish Sign Language

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Adult hearing readers can automatically use phonological codes during the early stages of printed word recognition. For instance, a number of experiments with adult hearing readers have shown faster word identification times on the target word "BRAIN" when preceded briefly (around 50 ms) by the pseudohomophone prime "brane" than when preceded by the orthographic control prime "brant" (see Rastle & Brysbaert, 2006, for review). Despite abundant research carried out on this topic, the use of phonological codes by deaf readers is still under debate, with approximately only half of the studies reporting phonological effects (Mayberry, del Giudice, & Lieberman 2011). Indeed, the few studies that have used masked priming failed to find evidence of phonological involvement during the early stages of word processing (Bélanger, Baum, & Mayberry 2012; Cripps, McBride, & Forster, 2005). These results appear to strengthen the case for an absence of automatic phonological processing in deaf readers. However, the possibility remains that the standard masked priming technique lacks sensitivity to capture a phonological effect in deaf readers. For instance, masked phonological priming can only be obtained with hearing children when using a slightly longer prime duration (see Comesaña, Soares, Marcet, & Perea, 2016).The current experiment examined whether there is automatic phonological involvement during the early moments of lexical processing in deaf readers when the opportunity to enable priming is maximal. To that end, we modified the standard masked priming procedure in two ways: 1) the target was presented very briefly between the forward mask and the prime (i.e., sandwich technique); and 2) there was a 50ms blank between the offset of the prime and the onset of the target (see Figure 1 for details). Participants made a lexical decision to targets preceded by a pseudohomophone (e.g., vurro BURRO; /bu.ro/-/bu.ro/ [BURRO is the Spanish for donkey]) or an orthographic control prime (nurro-BURRO; /nu.ro/-/bu.ro/).

Twenty four deaf readers took part in the experiment. All of them were fluent signers of Spanish Sign Language ("Lengua de Signos Española": LSE). However, their age of acquisition of LSE differed: eight individuals learnt LSE from birth (*native signers*), 9 individuals learnt LSE at an early age (3 9 years old; *early signers*), and seven individuals learnt LSE after 9 years old (*late signers*). We also recruited a sample of 24 hearing controls matched in age, nonverbal IQ, socioeconomic variables and reading habits (i.e. how often they read a magazine/book/internet post) and sentence reading level. Measures of reading comprehension of texts as well as accuracy for syllable counting task, and an estimate of knowledge of written words were collected for all participants.

Results

The mean correct RT in each experimental condition is presented in Figure 1. We employed an Analysis of Variance (ANOVA) with Group (Deaf, Hearing) as a between- subject factor and Prime target phonological relationship as a within-subject factor.

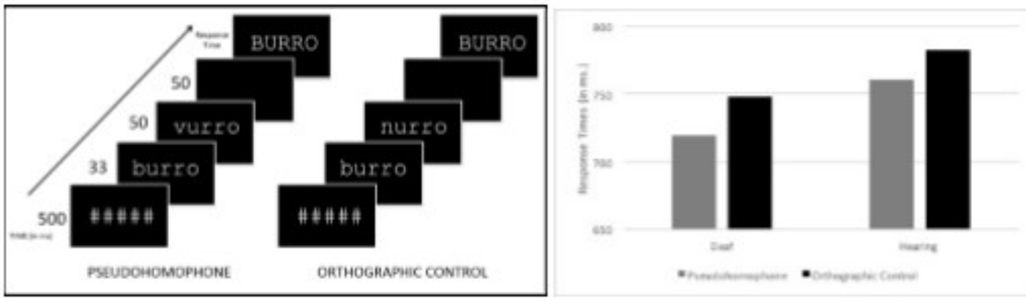

Figure 1. Representation of the procedure in the experiment (left panel) and Mean correct reaction times (RTs) for the different experimental conditions (right panel).

The ANOVA showed that word response times were significantly faster for targets preceded by a pseudohomophone prime than for targets preceded by an orthographic control (740 vs. 765 ms, respectively). Importantly, the magnitude of masked phonological priming was similar for hearing and deaf readers. While the critical inter-action was not significant ($F < 1$), we thought it was necessary to check whether the masked phonological priming effect was significant when the analyses only involved the group of deaf readers. Indeed, we found that the 29 ms phonological priming effect in the group of deaf readers was significant ($p < 0.001$).

We also thought it was important to examine whether the magnitude of phonological involvement during word processing could be affected by Age of Acquisition of LSE. To that end, we conducted an ANOVA with two factors (Prime target relationships: pseudohomophone vs. control; Subgroup: native signer, early signer, late signer). While the size of the masked phonological priming was greater for the native signers (39 ms) and late signers (30 ms) than for early signers (19 ms), the interaction between Prime target relationships and Subgroup did not approach significance, $F < 1$.

In addition, deaf readers showed a poorer performance than the hearing readers in text comprehension, know-ledge of written words, and accuracy in a syllable counting task. For the deaf readers, age of acquisition of the LSE did not modulate these variables. Finally, further analysis showed that knowledge of written words correlated with the magnitude of the masked phonological priming (r =- .57, p = .004) in deaf readers.

Discussion

The key finding is that deaf readers can activate phonological codes early in processing. Note that, unlike previous experiments, we maximized the chances to detect phonological priming by using a sandwich procedure and a slightly longer stimulus onset asynchrony. Importantly, phonological involvement during printed word recognition was not modulated by the age of acquisition of LSE, but by knowledge of written words. The presence of a relationship between the size of phonological priming and knowledge of written words goes in line with the view that deaf readers might develop their phonological awareness through reading (e.g., see Kyle & Harris, 2010). Further research is needed to investigate whether hearing and deaf readers reach similar behavioural phonological priming through the same mechanisms.

References

Bélanger, N. N., Baum, S. R., & Mayberry, R. I. (2012). Reading difficulties in adult deaf readers of French: Phonological codes, not guilty! *Scientific Studies in Reading, 16*, 263–285.

Comesaña, M., Soares, A. P., Marcet, A., & Perea, M. (2016). On the nature of consonant/vowel differences in letter position coding: Evidence from developing and adult readers. *British Journal of Psychology, 107*, 651–674.

Cripps, J. H., McBride, K. A., & Forster, K. I. (2005). Lexical processing with deaf and hearing: Phonology and orthographic masked priming. *Arizona Working Papers in Second Language Acquisition and Teaching, 12*, 31–44.

Kyle, F. & Harris, M. (2010). Predictors of reading development in deaf children: A three year longitudinal study. *Journal of Experimental Child Psychology, 107*, 229-243.

Mayberry, R., del Giudice, A., & Lieberman, A. (2011) Reading achievement in relation to phonological coding and awareness in deaf readers: A meta-analysis. *Journal of Deaf Studies and Deaf Education, 16*, 164-188.

Rastle, K., & Brysbaert, M. (2006). Masked phonological priming effects in English: Are they real? Do they matter? *Cognitive Psychology, 53*, 97-145.

The Influence of Iconic Linguistic Expressions on Spatial Event Cognition across Signers and Speakers: An Eye-Tracking Study

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All humans have the capacity to perceive and understand important aspects of spatial events, which occur frequently in daily life. For example, if we are looking for a pen we might search for it on the table, under the newspaper, or in a bag. How do we translate these spatial events into language and does the way we linguistically encode them guide our attention to the events differently? Speakers make use of arbitrary linguistic forms such as pre- and postpositions and spatial nouns (i.e., in English ‘left’, ‘front’, ‘on’) to talk about spatial relations. However, signers use visual articulators such as hands, mouth, face, body, and eye-gaze to encode events linguistically. Thus encoding of spatial events is highly influenced by visually-motivated, analogue form to meaning mappings known as iconicity (Emmorey, 2002). For example, to represent a pen next to a paper, signers most frequently use one hand to represent the shape of the paper (in the form of so- called “classifier predicates”) and the other to represent the pen, thus placing both hands next to each other, matching the signers' view of the relative relations of the entities to each other (see Fig. 1). Conversely, speakers may use the spatial relational noun *left* to express the relation between the pen and the paper. The forms of spatial encodings in spoken languages are therefore not only arbitrary in relation to the events but also more categorical than the iconic and analogue structures used in sign languages.

Previous research has shown that crosslinguistic variability in speakers’ encoding of spatial events influences cognition, in the form of recognition memory or visual attention to events (e.g., Flecken et al., 2011; Majid et al., 2004; Papafragou et al., 2008). However, it is less explored whether iconic and analogue structures in sign languages guide signers' attention to events differently than that of speakers.

The present study examined whether the iconic and analogue structures of signed languages guide signers' visual attention to left/right spatial configurations of two objects (e.g., the pen is left/right to the paper) differently than for speakers during planning of linguistic production (i.e., their “thinking-for-signing”). To do so, we recruited 10 NGT and TID signers and 10 native Dutch and Turkish speakers. In a visual world production eye- tracking paradigm, we presented displays with four pictures (see Fig. 2). Each picture included the same two objects which were in different spatial relations to each other. A visual cue in the form of an arrow pointed at the target picture. In a within subjects design, participants were first asked to only observe the four picture displays (i.e. Nonverbal task) and later they were asked to describe the picture at which the arrow was pointing (i.e. verbal task). This design was used to assess whether language may influence cognition differently in a linguistic context than in a nonlinguistic context. Experimental displays contained either left AND right configurations in one display (i.e. Contrast condition) or left OR right configurations in one display (i.e. No Contrast condition), serving as baseline condition. More specifically, the displays in both conditions always contained a target (left or right), a viewpoint dependent competitor on the sagittal axis (behind/ front) and one distractor (in/on/under). Importantly, a contrast competitor (left or right, depending on target) was present in the displays of the Contrast condition but absent in the No Contrast condition. An additional distractor (in/on/under) took the contrast competitors' position in the No Contrast condition. The presence or absence of the contrast competitor gives insight into whether competition in eye gaze occurs between left and right configurations. We predicted that signers would be less likely to look at the contrast competitor in the Contrast condition than speakers due to signers' use of iconic, analogue, and non-categorical constructions.

Eyegaze patterns of signers and speakers were recorded with a portable SMI RED 250 and were analyzed collapsing results from both types of sign languages on the one hand and spoken languages on the other. Preliminary results indicate that in the Contrast condition of the verbal task speakers directed more looks than signers to the contrast competitor versus the distractors. In the No Contrast condition of the verbal task, however, eye gaze patterns to the pictures were similar between signers and speakers. Furthermore, eye gaze patterns from signers and speakers found in the Contrast condition in the verbal task were not observed in the non verbal task, indicating that language may influence cognition only during planning for language production. These results suggest that speakers may perceive left/right configurations as different categories due to their categorical and arbitrary linguistic expressions, thus paying more attention to the contrast competitor. Signers, on the other hand may perceive left/right configurations as separate (i.e., not categorically related) concepts due to their use of iconic and analogue constructions, thus do not guide their visual attention to the contrast competitor. This study provides first evidence that the iconic and analogue structure of sign languages may influence the way signers conceptualize left/right spatial configurations differently than that of speakers.

Rapid processing of ELAN data: quick and dirty numbers for statistical analysis of non-manual features

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We developed an algorithm that aids in the rapid processing of data stored in ELAN files. ELAN is a tool used by sign language researchers to annotate video data (Crasborn & Sloetjes, 2008). Navigating and searching within ELAN files is clumsy, which may make drawing inferences from the data complicated or time consuming. This problem is apparent when attempting to unearth the phonetic correlates of syntactic and prosodic functions.

As sign languages may convey linguistic information simultaneously on the hands, and on the face and body (‘nonmanuals’ [NMs]), noticing or extracting patterns of simultaneity may be difficult. For instance, brow raise is widely reported in ASL as a marker of topics, y/n questions, and other grammatical functions (Wilbur & Patschke, 1999). However, there may be secondary articulators that signal that one function is intended over another.

At present, the only reliable way to explore NM overlaps in ELAN is by counting by hand. However, this is undesirable for larger files and for multiple tiers. ELAN does have an overlap counter via its search capability (“Search > Structural Search Multiple eaf > Multiple Layer Search”). It is possible to return the number of overlaps between 2 tiers. However, when searching for 3+ tiers, overlaps are always reported w.r.t. a single, base tier. For example, based off the hypothetical data in Fig. 1, if Tier 1 is taken as the base, a search for overlaps of 3 tiers will return annotations {b, e, g}, as desired. However, running the same search with Tier 4 as the base returns annotations {a, b, d, e, g}. That is, ELAN overreports overlaps: while annotations {a, e} both overlap with annotation {g}, they don't overlap with each other. As such, one would have to run up to n! searches (where n is the number of tiers) and remove undesired overlaps.

The solution offered by BenitezQuiroz et al. (2014) is more powerful. They apply a computational model, whereby their algorithm scans ELAN files and learns which NMs reli- ably distinguish between members of a set of five sentence types. For example, the authors were also able to find that a leftward headturn is the mostdistinguishing non-manual of hypothetical sentences, which had not previously been reported for ASL.

However, BenitezQuiroz et al.'s solution is limited in certain ways. The names of the NM tiers, manual tier(s), and sentence type tier are stitched into the program, meaning that their code looks for a particular suite of tier names. This limits the number and nature of research questions explorable through their software. Second, although the authors provide their code, they don't provide a minimal working example. We tried to replicatetheir findings on our own data, and were unsuccessful. Further, the authors warn that certain analyses may takedays to complete.

Tier 1 —a— —b— —c— Tier 2 —d—

Tier 3 ——e—— —f— Tier 4 ————g————

Figure 1: A hypothetical ELAN window

Who'scounting	E(yes)/G(loss)	E/P(olarity)	G/ P	E/P/G	P/E/G
(a)Handcount	51	52	133	45	45
(b)ELAN	55	52	138	158	60
(c)Ourprogram	52	51	136	49	49

Figure 2: Overlap tallies of 2 and 3 tiers of a sample ELAN project, (a) by hand, (b) using ELAN's 'Structured search multiple eaf ' function, and (c) using our algorithm.

By contrast, our code allows for more exploratory research: it can return the number of overlaps for any number of specified or unspecified tiers. As such, our code will work with ELAN files that have different architectures from the one assumed by the BenitezQuiroz group. One further advantage is that our code can be executed in a web browser, so data can be processed quickly and on the fly. The tradeoff, though, is that our code does not itself find meaningful overlaps and does not provide detailed statistics for what it finds yet. (The raw numbers can be plugged into the researcher's preferred statistical software).

At present, our algorithm is flexible enough to provide the following information: Scenario 1: Given tiers of interest, our code reports every combination of overlap. For instance, in the hypothetical ELAN file (Fig. 1),our code can tell us that Tier 1 and 4 overlap twice; Tiers 1, 3, and 4 overlap once; and that Tiers 1 and 2 don'toverlap at all. Further, the values of the overlaps are returned. So, while Tiers 1, 3, and 4 do overlap generally,the specific annotations c and f don't overlap with Tier 4. We imagine that researchers looking to find general patterns would benefit here. For instance, if Tier 4 represents brow position, annotation g represents brow lowering, we might predict that annotation b is a wh-word, while annotation c is not.

Scenario 2: Our code can also run more specific searches for hypothesis testing. A researcher could search specifically for a word and return (a) all of the tiers that overlap, (b) the specific annotation values that overlap, and (c) the frequencies and durations of those overlaps. Points (a,b) allow researchers to see what tiers and annotations overlap with a word like WHO (e.g., lowered brows, head tilt, etc.). Point (c) allows for the exclusion of rare overlaps and those that do not meaningfully overlap (i.e., potential flukes; perhaps there was only 1 head tilt occuring with WHO across the whole dataset).

We validated our code by hand tallying overlaps in ELAN for small set of tiers. We recorded cases of 1, 2, and 3 overlaps (Fig. 2a) and compared them to ELAN's search function and our code's results. ELAN produces comparable counts for any combination of 2 tiers tested, as do we. However, ELAN overreports overlaps (for reasons mentioned above) when 3 tiers are compared. What's more, depending on what order the tiers are compared in, different figures result. Our algorithm produces consistent, comparable results.

References

Benitez-Quiroz, C., Gokg¨oz, K., Wilbur, R., & Martinez, A. (2014). Discriminant features and temporal structure of nonmanuals in ASL. PloS one , 9 (2), e86268.

Crasborn, O., & Sloetjes, H. (2008). Enhanced ELAN functionality for sign language corpora. In Proceedings of LREC 2008, 6th intl. conference on lang. resources and evaluation.

Wilbur, R., & Patschke, C. (1999). Synt. correlates of brow raise in ASL. SLL, 2 (1).

Executive function in deaf native signing children: the relationship of language experience and cognition

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Studies based on experimental tasks (Figueras, Edwards, Langdon, 2008) and a behavioral inventory (Hintermair, 2013) have revealed that deaf children experience difficulties in executive function (EF). Deficits in EF seem to be connected to language delays rather than to hearing loss *per se*. Deaf native signing children with no language deprivation obtain similar scores to their hearing peers when EF is determined by parent report questionnaire (Hall et al., 2016). This poster presents research that has used experimental tasks to assess the EF level of deaf native signing children in comparison to hearing children's performance.

Two groups of children, matched on age and gender, participated in the study: deaf native signing children who have acquired sign language from their Deaf parents (N=20, age: M= 9;11, SD=1;11, ♂=4 ,♀=16) and typically developing hearing children (N=20; age: M=9;11; SD=1,11, ♂=4 ,♀=16). The nonverbal intelligence was controlled (Raven's Progressive Matrices, intergroup comparison: MannWhitney[1] U=150, p= .164). The five components of executive function were analyzed with the following assessment tools: cognitive flexibility – Wisconsin Card Sorting task; interference suppression, Simon task; response inhibition, Go/No go task; working memory, Corsi Block; and planning, Tower of London. The intergroup differences were not significant on four EF variables: cognitive flexibility (Mann-Whitney U=157, p= .334), interference suppression (one-way repeated- measures ANOVA, F(1,38)=0.44, p= .511), working memory (MannWhitney U=132, p=.438) and planning (t(38)=0.78, p= .438). Only in the Go/No go task did deaf children perform significantly worse than hearing peers (t(30)=2.72, p= .001). After dividing the two groups into younger groups (age < 10;00) and older groups (age ≥ 10;00), no significant differences were found between the hearing and deaf older groups (t(19)=0.42, p= .677), but there were still significant differences between the two younger groups (t(15)=4.71, p= .001). These results show that deaf signing children with early language exposure to sign language perform similarly to hearing peers on experimental EF tasks. Early immersion in natural sign language is likely to support higher cognitive functioning in deaf children.

Those findings are in accord with a large scale study of deaf children (Botting et al. 2015) showing that language skills play a crucial role for EF performance. Deaf children who have acquired sign language as a first language do not suffer from deficient EF like deaf children with language delays (Kronenberger et al., 2014).

Weaker inhibition response was observed just in the younger group, who may still be learning how to suppress reaction. Similarly, Dye and Hauser (2014) found that younger deaf children can still struggle with deficient cognitive control in continuous performance test (Dye, Hauser, 2014).

References:

Botting, N., Jones, A., Marshall, C., Denmark, T., Atkinson, J. & Morgan, G. (2016). Non- verbal executive function is mediated by language: A study of deaf and hearing children. *Child Development*, 1-12.

Dye, M.W., & Hauser, P., (2014). Sustained attention, selective attention and cognitive control in deaf and hearing children. *Hearing research, 309*, 94-102.

Figueras, B., Edwards, L., & Langdon, D., (2008). Executive function and language in deaf children. *Journal of Deaf Studies and Deaf Education*, *13*, 362-377.

Hall, M., Eigsti, I. M., Bortfeld, H., & LilloMartin, D. (2016). Auditory Deprivation Does Not Impair Executive Function, But Language Deprivation Might: Evidence From a ParentReport Measure in Deaf Native Signing Children. *Journal of Deaf Studies and Deaf Education*, 22(1), 1–13.

Hintermair, M. (2013). Executive functions and behavioral problems in deaf and hard of hearing students at general and special schools. *Journal of Deaf Studies and Deaf Education, 18 (3),* 344-59.

Kronenberger, W.G., Pisoni, D.B., Henning, S.C., & Colson, B.G., (2013). Executive functioning skills in long-term users of cochlear implants: A case control study. *Journal of Pediatric Psychology,* 38*,* 902-914.

Sentence Repetition Task in French Sign Language: a new approach to assess LSF abilities

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Sign language assignment has been an issue for 15 years. Several tools in different sign languages have been created, and each of them has a specific goal : assessment of sign language as a first language, sign language as a L2, lexical development, cognitive abilities, etc. (Haug, 2008. http://www.signlang-assessment.info). Actually, there is no available test, which assesses LSF. As a consequence, researchers, teachers and therapists have not reliable benchmarks about LSF acquisition, and doesn't know how assess linguistic skills in an efficient way. So, in the wake of Courtin's work on LSF assessment (2010), and other sign- language assessment tools, our general goal is to develop a series of tests to assess linguistic abilities in LSF.

Among the numerous tasks, which allow us to evaluate language skills, Sentence Repetition Task (SRT) seemsrelevant to sign languages. Often used in Vocal Languages (VL), SRT enables to obtain a good representation oflanguage abilities while being quick to be administered and easy to score. If this task is successful in adults, children tend to fail because their phonological skills and linguistic representations are not strong enough (Mason et al, 2010). This task is also considered as a relatively reliable marker of language development and language processing (Chiat et al., 2013). In addition, a poor performance on the task is considered as a typical marker of Specific Language Impairment (for VL, Conti-Ramsden et al., 2001; for SL, see Marshall et al., 2015).

The aim of the present study is twofold: first, we'll present the new Sentence Repetition Task elaborated in LSF; second, we'll present data in the SRT collected in a transversal way. Thirty five deaf children, aged from 4.2 years old to 10.8 y.o, were tested on their repetition abilities. All children were native signers, have been exposed to LSF at birth, and have no history of language disorders. The children were to repeat 15 sign sentences from a video produced by a French native adult signer. The dependant variable was the comparison between the children's repetitions and the production to the native signer. We thus obtain quantification of phonological, morphosyntactic and lexical errors in the children productions. As expected, our data showed better repetition ability in the older children. For younger children, while their repetition performance were quite good, they showed more sign omissions, unfinished sentences, inaccurate phonological parameters and errors in morphosyntactic localisations.

These results are discussed in terms of developmental stages of LSF acquisition and its mastery. In addition, these data constitute a first step for providing a normative database. Further investigations will aim to combine these repetition data with narrative production of a cartoon. Another interesting perspective will be to test some children with atypical acquisition as late signers and children with Specific Language Impairment. This work is in progress.

References

Courtin, C., Limousin F. & Morgenstern A « Evaluer les compétences linguistiques des enfants en languedes signes française : une expérience pionnière », LIA pp 129-158

Chiat, S., ArmonLotem, S., Marinis, T., Polisenska, K., Roy, P. & SeeffGabriel, B. (2013). The potential of sentence imitation tasks for assessment of language abilities in sequential bilingual children. In: V. Mueller-Gathercole (Ed.), Issues in the Assessment of Bilinguals. (pp. 56 89). UK: Mulitlingual Matters.ISBN 9781783090082

ContiRamsden, G., Botting, N., & Faragher, B. (2001). Psycholinguistic markers for specific language impairment (SLI). Journal of Child Psychology and Psychiatry, and Allied Disciplines, 42(6), 741–748.

Mason, K., Rowley, K., Marshall, C. R., Atkinson, J. R., Herman, R., Woll, B. & Morgan, G. (2010). Identifying specific language impairment in deaf children acquiring British Sign Language: Implications for theory and practice. British Journal of Developmental Psychology, vol. 28, 33-49.

Haug, T. (2008). Review of sign language assessment instruments. In Sign Language Acquisition (Jonh Benjamins Publishing., pp. 51 85). Amsterdam: A. Baker & B. Woll (Hgs). For an electronic review, see http://www.signlang-assessment.info/

Marshall, C., Mason, K., Rowley, K., Herman, R., Atkinson, J., Woll, B., & Morgan, G. (2015). Sentence Repetition in Deaf Children with Specific Language Impairment in British Sign Language. *Language Learning and Development*, *11*(3), 237–251. https://doi.org/10.1080/15475441.2014.917557

Comparison of iconicity judgments by Deaf signers and hearing non-signers

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In psycholinguistic studies on sign language, determining iconic and non iconic signs (or the degree of iconicity) is managed by taking iconicity judgments by hearing nonsigners or deaf signers depending on the nature of the research question. However it is not certain that non- signers' judgments are appropriate for certain studies.   How and in what respects do deaf signers and hearing nonsigners differ in noticing links between signs and their meaning? In this study, we ask this question which has been understudied. The answers has methodolog-ical implications for psycholinguistic studies that use iconicity ratings from hearing non-signers.

To follow this inquiry, we collected iconicity ratings from Deaf signers and hearing non- signers. In addition, familiarity ratings were gathered from deaf signers.

The iconicity ratings were obtained from 4 deaf signers for iconicity (age 33 47, M=32.3), 5 deaf signers for familiarity (age 33 47, M=33.4). 3 of the signers learned sign language since birth, the others were exposed to sign language in deaf schools (age of exposure 8 and 16). 6 hearing nonsigner participants rated the signs for iconicity (age 21-25, M=23.3).

The test materials consists of 328 signs that were selected from various Turkish Sign Language dictionaries. Signs with fingerspelling are excluded. Phonological variants of the same concept are included. The videos included a Turkish subtitle in order to make sure that all deaf participants think about the same meaning of a polysemous sign when evaluating whether there is a link between the sign form and the meaning.

As for the procedure, the deaf participants watched an instruction video, whereas hearing participants got the instructions on print with example pictures. The instructions were adapted from a norming study on BSL (Vinson, Cormier, Denmark, Schembri, & Vigliocco 2008). In pilot studies we observed that when there is no response time limitation, certain signers can overthink and find nonapparent similarities between the sign and its meaning, thus, inflating the iconicity degree of a sign. In order to avoid this drawback, we put a 10 seconds time limitation after each sign to decide the ratings. If participants can not rate in 10 seconds, two options were displayed: "I don't know the sign", and "I am neutral".

We found that overall, deaf participants (M=4.26, SD=2.04) rate the signs as more iconic than hearing partici-pants (M=3.59, SD=1.84); $t(654)= 4.406$, $p<.001$. This result suggests that, lacking sign language experience, hearing participants' gesture repertoire is not always enough to detect the iconic links that deaf signers notice aslanguage users.

We examined whether there is an agreement on what participants rate as highly iconic (higher than 6.5 in 1-7 scale), and noniconic (lower than 1.5 in 1 7 scale). We found that if hearing signers evaluate a sign as highly iconic, most probably deaf signers regard the sign as highly iconic as well (15 signs out of 18). On the other hand, hearing signers do not necesserily agree with what the deaf signers rate as highly iconic (15 signs out of 60). Moreover, we examined the signs where the deaf and the hearing participants differ more than 3 points. All these signs are rated above 5.3 by deaf signers, that is, deaf iconicity ratings are always higher than hearing ratings in this subset of signs. These findings support the same conclusion that hearing participants might not detect iconic links. When we examine the other end of the scale, there is not much agreement on highly non-iconic signs. Still, among all noniconic signs as rated below 1.5 by deaf signers, hearing nonsigners rate below 2.3.

In addition, we explored the association of familiarity and iconicity. There is no correlation between Deaf signers' familiarity and hearing participants' iconicity ratings, $r = .09$, $p = .10$. On the other hand, there is a weak correlation between deaf signers' iconicity and familiarity ratings, $r = .18$, $p = .001$. Our findings are partially parallel to the results in the literature. In a previous research on ASL (Sehyr, Caselli, Cohen-Goldberg, & Emmorey, 2016) which gathered iconicity ratings from hearing participants found a negative correlation between iconicity and familiarity, while a study on BSL (Vinson et al., 2008) conducted with deaf participants found a positive correlation as we did.

We conclude that the differences between judgments might be due to the fact that hearing nonsigners might not see iconicity in a level as deep as deaf signers. The methodological implication is that, if a researcher aims to find iconic signs (e.g. for stimulus selection for an experiment), collecting data from hearing participants can beviable. However, if the research goal is concerned with the whole spectrum of iconicity, then, collecting ratings from deaf participants would give more accurate results.

References

Sehyr, Z. S., Caselli, N., CohenGoldberg, A., Emmorey, K. (2016). ASL LEX: A lexical database for American Sign Language. Poster Presentation at TISLR 2016, Melbourne.

Vinson, D. P., Cormier, K., Denmark, T., Schembri, A., & Vigliocco, G. (2008). The British Sign Language (BSL) norms for age of acquisition, familiarity, and iconicity. *Behavior Research Methods*, *40*(4), 1079-1087.

Signing Irony in LIS

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Background. A remark such as "What a wonderful present!" can be interpreted either literally (i.e. I really like it) or ironically (i.e. I don't like it at all). Ironic remarks can be recognized by the discrepancy between what is said and the context of utterance (e.g., it is clear that the speaker does not like the present, still she says that it is wonderful). In spoken languages, ironic statements are often characterized by the presence of specific prosodic cues, such as prolonged articulation and exaggerated pitch (e.g., Ackerman 1983; Capelli, Nakagawa & Madden 1990; but see Bryant & Fox Tree 2005 for a criticism). In signed languages, semantic prosodic features(e.g., the difference between statements and questions) are conveyed by means of non-manual markings.

Focusing on Italian Sign Language (LIS) the present study aims at exploring: i) whether there are manual and non-manual disambiguation cues that distinguish ironic from literal remarks, and, in particular, (ii) whether ironic criticism (IrCrit: positive remark in negative context) is expressed differently from ironic compliment (IrComp: negative remark in positive context).

Methods. By means of a Discourse Completion Task (Félix-Brasdefer 2010) we obtained a semi-spontaneous elicitation of the literal and ironic version of a total of 10 remarks. We presented our native signers with a context (either positive or negative), and asked him/her to produce a final remark. Crucially, the very same remark was elicited after a situational prompt that favored its literal interpretation, and another one that induced its ironic interpretation. To avoid production bias, the two versions of the same remark were elicited in two different and temporally distant moments (six months gap).

To illustrate the task, the remark "What a wonderful present!" has been elicited after the context (1a), favoring its literal interpretation, and (in a second session) after the context (1b), inducing its ironic interpretation:

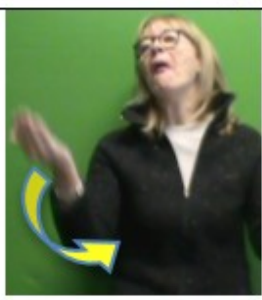
> (1a) Tommy and Chiara are siblings. For Chiara's birthday, Tommy is asked to buy a present. He uses all his savings to buy his sister the doll she longs for. As she receives it, she reacts with enthusiasm.
>
> (1b) Tommy and Chiara are siblings. For Chiara's birthday, Tommy is asked to buy a present. When he goes to the bookshop, he is fascinated by a book about his favorite rock band and decides to buy it for his sister. As she receives it, she gets disappointed.

We thus obtained ten minimally differing pairs of sentences. Each pair includes the same remark with two different interpretations: literal and ironic. Since there were five negative and five positive contexts, among the ten ironic remarks, five are IrCrit and the other five are IrComp. For the time being, data have already been collected from two Deaf native signers. Our goal is to elicit data from at least two other informants so that consistency across signers can be checked and a more accurate picture can be drawn. Both the literal and theironic remarks were manually coded in ELAN (Crasborn & Sloetjes 2008). An annotation template was conceived to code for both manual items (sign glosses and gestures) and nonmanual markers (body posture, head, eyebrows, eyes, gaze, mouth). The data annotation was conducted by two blind annotators to ensure accurate and bias-free coding.

Preliminary results. The comparative analysis between literal and ironic expressions in LIS confirms the importance of prosody in conveying the signer's communicative intention and reveals that irony is expressed through a specific array of manual and non-manual cues.

Manual markers. In some ironic remarks we observed the presence of 'PROPRIO' (tr. REALLY), an intensifierused to add emphasis to the ironic expression. Gestures also play a special role in signaling irony in LIS: they can be produced at the beginning and/or at the end of the ironic remark (gestural onset and/or coda). The open-hand gesture shown in (2) co-occurs with IrCrit, while the close-hand gesture in (3) co-occurs with IrComp. Overall, the movement component of the signs appears slower and more exaggerated in ironic remarks. This prosodic aspect should be quantitatively evaluated in depth once a richer corpus of remarks is available.

Non-manual markers. As expected, irony in LIS is marked by specific non-manuals cues. In particular, these are realized by the position of the head and the mouth. Unlike literal remarks, ironic ones are often produced with slightly tilted head (as shown in 2 and 3). Moreover, IrCrit is marked by head nods, while IrComp by head shakes. As for the mouth, we observed the following distinction: IrCrit correlates with mouth corners down (as in 4), while IrComp with a smiling facial expression (as in 5).

Gestures		Mouth markers	
			
(2) Open-hand gesture in IrCrit	(3) Close-hand gesture in IrComp	(4) Mouth corners down in IrCrit	(5) Smile in IrComp

Discussion. These preliminary findings confirm the existence of visual cues disambiguating ironical vs. literal remarks in LIS. The tilted head may suggest a deviation from conventional nonfigurative language. This study also reveals that the expression of irony in LIS should not be considered a homogeneous phenomenon, since the language offers distinct prosodic strategies to mark IrCrit and IrComp. As for IrCrit, we argue that the open-hand gesture and the head nods have a mocking function and the use of mouth corners down strengthens the intended criticism. In IrComp, both the close-hand gesture and the head shake suggest that the statement should not be taken seriously. The smiling expression is likely to be used to mitigate the apparent criticism expressed by the sentence.

Conclusions. This study shows that, as for spoken languages, the expression of irony in LIS rely on precise gestural and prosodic cues intended to help the interlocutor overcome the mismatch between what is said and what is meant. Further research is needed to delineate which cues are more helpful for irony comprehension in LIS, and to compare non-manual markers of irony in LIS with specific behavioural cues that characterize the production of irony statements in spoken languages (Winner 1997; González-Fuente et al. 2015).

Selected references. Ackerman, B. P. (1983). Form and function in children's understanding of ironic utterances. *Journal of Experimental Child Psychology*, 35(3), 487-508.

Capelli, C. A., Nakagawa, N., & Madden, C. M. (1990). How children understand sarcasm: The role of context and intonation. *Child Development*, 61(6), 1824-1841.

Félix- Brasdefer, J. C. (2010). Data collection methods in speech act performance. *Speech act performance*, 26, 41.

González-Fuente, S., Escandell-Vidal, V., & Prieto, P. (2015). Gestural codas pave the way to the understanding of verbal irony. *Journal of Pragmatics*, 90, 26 47.

Winner, E. (1997). *The point of words: Children's understanding of metaphor and irony*. Harvard University Press.

Assessing morphosyntactic skills in LSF (French Sign Language): focus on predicative structures

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Up to now, no reference tools can be found to assess LSF competence and identify potential SLI. This is due to i) the paucity of linguistic descriptions of LSF, in terms of first language acquisition and developmental stages in children, and ii) the failure of previous attempts to adapt tests from other Sign Languages (SL) (no cross-linguistic, standardized tests are available, Courtin & al., 2010; Haug,

2008). Just as in spoken language, SLI in SL is characterized by heterogeneous language skills. Yet the speech modality induces a number of differences. Morphosyntactic disorders in SL can be linked to the way the signer uses: semantico-syntactic space (Quinto-Pozos, 2011), agreement morphology and classifier system (Morgan et al., 2007). In a previous study (Puissant-Schontz, 2013), we created a pilot assessment tool, which proved insufficient to investigate predicative structures, due to the lack of overall description of the predicative system.

This paper aims at filling this gap, and proposes a more fine-grained classification of predicative structures in SL. After a corpus analysis of different speech-situations, we select formal features in order to classify predicates: i) action predicates: manual contact with the body, manual orientation, manual movement (with a change of grammatical space), and configuration, ii) existence predicates: standard sign, gaze, chest movement, pointing, classifier and iii) property assignment predicates: standard sign, facial expression and classifiers. We present hypotheses on the impact of the type and the number of clues in the acquisition.

We then proceed to work out an assessment tool for 4 to 10 y.o children, with reception and production tasks, with a view to test sign language acquisition and diagnose potential SLI or delayed acquisition. The assessment tool could also be used as a basis for remediation protocols. And the classification of predicative structures could be used in others SL.

References

Courtin, C., Limousin F. & Morgenstern A. (2010). « Evaluer les compétences linguistiques des enfants en langue des signes française : une expérience pionnière », LIA pp 129-158

Haug, T. (2008). Review of sign language assessment instruments. In A. Baker & B. Woll (Hgs.) Sign language acquisition, S. 51-85. Amsterdam: John Benjamins Publishing Company.

Morgan, G., Herman. & Woll B (2007). Language impairments in sign language: breakthroughs and puzzles. International Journal of Language and Communication Disorders, 42, 97-105

Puissant-Schontz, L., (2013). Création d'un outil d'évaluation de la morphosyntaxe en LSF (Mémoire de Master 2 en Sciences du Langage). Université Paris Ouest Nanterre la Défense, Nanterre.

Quinto-Pozos, D., Forber-Pratt, A., & Singleton, J.L. (2011). Do developmental communication disorders exist in the signed modality? Perspectives from Professionals. Language, Speech and Hearing Services in Schools, 42 (4), 423-443

Modal-negation interactions in Japanese Sign Language

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Background: It has been observed that negation signs used in the same sign language indicate different scopes of negation, and may appear in multiple syntactic positions (Wood 1999). Japanese Sign Language (JSL), considered as a manual dominant language (Zeshan 2006), has a variety of negation signs (Morgan 2006). Their syntactic and semantic properties, however, have not been fully investigated.

Claim: Syntactic positions of three different negative JSL signs can be identified based on their ordering restrictions with modals.

Modal and negation signs in JSL: Ten epistemic modals, identified by Akahori, et al. (2013), were classified into three classes: True-High, True-Low, and Quasi, as shown in (1). The syntactic tests used for the classification were (i) the ordering restriction between the modal and the negation sign /NOT/, and (ii) the ordering restrictions between the modals.

(1) a. True-High (/TRUE/ 'absolutely', /WRONG/'isn't it', /MAYBE-NO^IDEA/ 'maybe'):

may not be followed by /NOT/, may not be followed by any modal-like expressions

b. True-Low (/MEAN/ 'meant-to', /ERROR/ 'without-doubt', /SEEM/ 'seem'): may not be followed by /NOT/, may be followed only by the True-High modals

c, Quasi (/DECIDE/ 'certainly', /SHOULD/ 'should', /PLAN/ 'expectedly', /MAYBE- IMAGINE/ 'could be'): may be followed by /NOT/, may be followed by any True modals; may not be followed by other Quasi modals

Three negation signs: In addition to /NOT/, used in the previous study, JSL sentences can be negated by two other negation signs.

(2) a. TANAKA COME NOT
'Tanaka does/did not come.'
b. TANAKA COME WOULD-NOT
'Tanaka does/did not come.'
c. TANAKA COME NOT-RIGHT
'It's not that Tanaka comes/came.'


NOT WOULD-NOT NOT-RIGHT

Though /NOT/ (2a) and /WOULD-NOT/ (2b, which may also be used as /NO-NEED/) seem to be almost interchangeble, the following example shows otherwise: unlike /NOT/, /WOULD-NOT/ may be used only as the negation of volition.

(3) a. CLOTHES TEAR NOT. 10-YEAR FINE. 'The garment doesn't tear. Fine for 10 years.'

b. *CLOTHES TEAR WOULD-NOT. 10-YEAR FINE.

Those three negations signs follow different ordering restrictions with modals. As described in (1), /NOT/ may follow a quasi-modal. However, as shown in the following examples with the Quasi-modal /DECIDE/ 'certainly', /WOULD-NOT/ cannot follow the modal:

(4) a. TANAKA COME WOULD-NOT DECIDE 'Tanaka certainly does not come.'

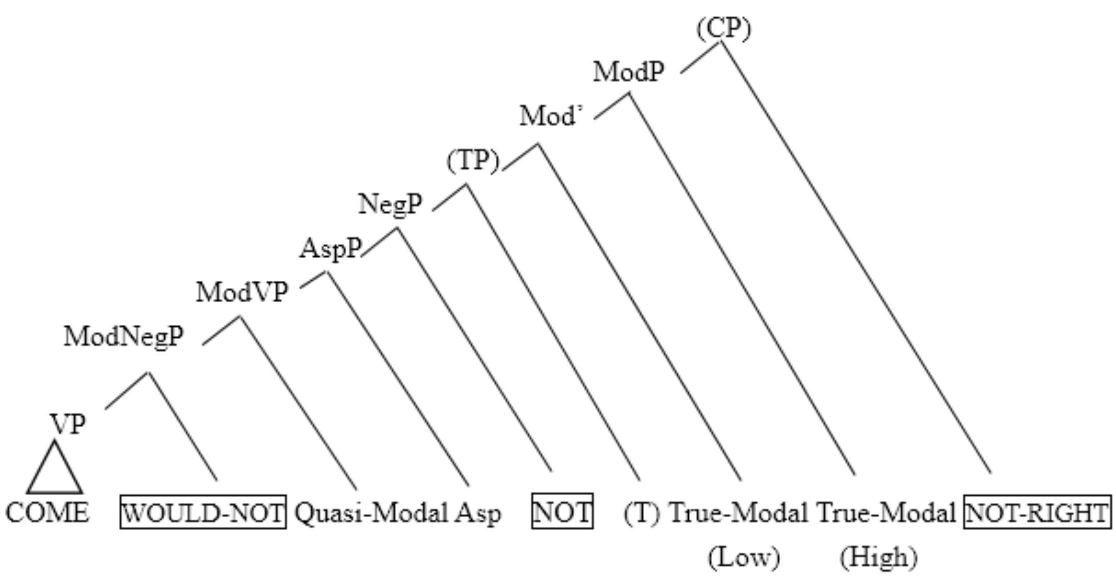
b. *TANAKA COME DECIDE WOULD-NOT 'It's not certain that Tanaka comes'

The negation sign /NOT-RIGHT/ may follow any modal, as shown in (5). This can be expected from the fact that the sign functions as the negation of the entire proposition.

(5) a. TANAKA COME TRUE NOT-RIGHT 'It's not that Tanaka absolutely comes.'

b. *TANAKA COME NOT-RIGHT TRUE 'Absolutely, Tanaka does not come.'

Analysis: The three negation signs appear in the following syntactic positions in the structure proposed by Matsuoka (2016).



References:

Akahori, H., Yano, U., Matsuoka, K., & Oka, N. 2013. Expressing modality: a descriptive study of Japanese Sign Language. A paper presented at the 147th Meeting of the Linguistic Society of Japan. Kobe City Univ. of Foreign Studies.

Matsuoka, K. 2016. Classifications of modallike expressions in Japanese Sign Language: a preliminary study toinvestigate the cartography of the right periphery. Poster presentation at FEAST Venice.

Morgan, M. W. 2006. Interrogatives and negatives in Japanese Sign Language. In: U. Zeshan(ed.) *Interrogativeand negative constructions in sign languages*. 91 127. Nijmegen: Ishara Press, 91 127.

Wood, S. 1999. Syntactic and semantic aspects of negation in ASL. MA thesis, Purdue Univ.

Zeshan, U. 2006. Negative and interrogative constructions in sign languages: a case study in sign language typology. In: U. Zeshan (ed.) *Interrogative and negative constructions in sign languages*. 91 127. Nijmegen: Ishara Press, 28-68.

Never Say Never: You never know what it might mean

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Lexical negation with regards to sentence-level ordering in ASL has been covered extensively in the signed language literature (Gokgoz 2011, Fischer 2006, Pfau & Quer 2004, and Wood 1999, among others), primarily with respect to NegP in the syntactic structure. In American Sign Language (ASL), NegP is positioned lower than TP as modals and verbs typically precede negative elements (Neidle et al. 2000, Wood, 1999). Wood (1999) argues the lexical negative appears in either preverbal (1) in Spec-NegP or sentence-final position (2), passing through Spec-NegP and landing in Spec-FocP. In this paper, we offer an updated analysis of negation in ASL, with a focus on an analysis for NEVER.

Wood (1999, 2015) examines four ASL lexical negatives: NOT, NOo, NOTHING, and NEVER. All four occur both pre- and post-verbally, albeit with a strong preference for sentence-final position. Each has its own paradigm of syntactic behavior. However, the syntactic structure for NEVER is keenly different than these three lexical negatives. The interpretation of NEVER is syntax-driven, with different meanings/scope in the preverbal and sentence-final positions, as seen in (3-4). NEVER pre-verbally negates the following verb phrase or proposition, much like the adverb 'never' in English. However, in sentence-final position, NEVER has scope over the subject only, changing the interpretation of the negative proposition, based on 'volition', as shown in the ungrammaticality of (6), in contrast with (5).

Following the Cinque (2006) hierarchy of adverbs/modals, we show that sentence-final NEVER is a volitional adverb positioned higher than preverbal NEVER, appearing in the rightward Spec-ModP$_{[volition]}$. We consider four possible approaches while analyzing the syntactic structure for NEVER, in both preverbal and sentence-final positions. One is rightward movement of NEVER from Spec-NegP to Spec-FocP with the negative operator in Nego, which is what Wood (1999) argues. The second possibility would be that there are two separate operators, one for the preverbal NEVER and another for the sentence-final NEVER, given the consideration of the two different interpretations they contain. The third analysis considers data from instances of doubling with NEVER and NEVER co-occurring with another negative item as in (7-8), asking whether the syntactic structure involves negative concord (NC), as seen in other languages such as DGS (strict NC) and TİD (non-strict NC) (Pfau 2014). A final consideration involves the discussion of NEVER in instances of doubling. That is, is the sentence-final NEVER a copy of the preverbal NEVER?

Adjudicating between these four perspectives on how to best analyze the structure, we show that the movement and copy/doubling accounts do not provide a well-defined analysis. The movement analysis would be only possible if you assume that preverbal NEVER moves to a position with a different operator, which would then lead to the next possibility of having two separate operators- one for each position and defined by its interpretation in that position, i.e. adverbial NEVER and volitional NEVER. With respect to NC, we look at data as in (7-8) and ask whether (7) constitutes an instance of NC or doubling. The question raises as to which NEVER is being doubled in (7), the preverbal or sentence-final one. In contrast to (7), it is clearly preverbal NEVER being doubled as (9) is ungrammatical. Due to the different interpretations for each position, we argue that it cannot be a copy or an instance of doubling. In the final analysis, we focus on a structure in which sentence final NEVER is positioned higher than preverbal NEVER, in which both have different operators. Also, ASL is a NC language, albeit with some parametric differences with other signed NC languages, such as DGS or TİD.

Most of the focus on negation in signed language is on the existence of lexical negative signs, nonmanual negative cues, and the position of the negative element within the clause rather than the syntactic structure of NegP. Looking at syntax-directed interpretation of negative lexical items leads to a deeper understanding of parametric differences and universals in NegP.

Examples

1.) IX NOT WORK EVERYDAY

‘He does not work every day’.

2.) IX WORK EVERYDAY NOT

‘He does not work every day.’

3.) JOHN NEVER EAT FISH

‘John has never eaten fish.’

4.) JOHN EAT FISH NEVER

‘John won’t eat fish.’

5.) BOB EAT FISH NEVER, MARY IX

‘Bob will not eat fish, but Mary will.’

6.) *BOB NEVER EAT FISH, MARY IX

‘Bob will not eat fish, but Mary will.’

7.) JOHN NEVER EAT FISH NEVER

‘John has never eaten fish.’

8.) ?JOHN WON’T EAT FISH NEVER

‘John won’t eat fish.’

(9) *JOHN NEVER EAT FISH NEVER

‘John won’t eat fish.’

References

Cinque, G. 2006. *Restructuring and Functional Heads: The Cartography of Syntactic Structures,* (Vol. 4). Oxford University Press.

Fischer, S. 2006. Questions and negation in American Sign Language. In U. Zeshan (ed.), *Interrogative and Negative Constructions in Sign Languages*, 165-197.

Gokgoz, K. 2011. Negation in Turkish Sign Language: The syntax of nonmanual markers. *Sign Language & Linguistics 14(1):* 49–75.

Neidle, C., Kegl, J., MacLaughlin, D., Bahan, B., & Lee, R. G. 2000. *The Syntax of American Sign Language: Functional Categories and Hierarchical Structure*. MIT Press

Pfau, R. 2016. A featural approach to sign language negation. In *Negation and Polarity: Experimental Perspectives*, 45-74. Springer International Publishing

Wood, S. 1999. *Semantic and Syntactic Aspects of Negation in ASL*, unpublished MA thesis, Purdue University, West Lafayette, IN

Wood, S. 2015. *Syntax-directed interpretation of NEVER in ASL*. Presentation at Special Symposium in honor of Phyllis Perrin Wilcox, University of New Mexico

The processing of locally ambiguous classifier constructions in Austrian Sign Language (ÖGS)

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The investigation of sign languages provides an important opportunity to extend our knowledge of how language modality may influence language processing and which aspects of language processing are independent of language modality. Despite the difference in modality, many studies have so far revealed intriguing similarities with respect to sign and spoken language processing. However, it has been shown that language modality influences both the linguistic structure and the neurocognitive processing of language in specific ways. Previous studies in this area focused on sign language classifier constructions that exploit the signing space to a greater extent (compared to lexical signs). In particular, in classifier constructions signing space is used topographically (e.g. Emmorey 2002; Corina & Spotswood 2012 for an overview).

In the present study we examined the processing of word order variations within classifier constructions expressing a spatial relationship between two human arguments. Previous neurophysiological as well as behavioral studies on ÖGS investigating the processing of word order variations involving lexical verbs revealed the existence of a “subject preference” in ÖGS (Krebs et al. submitted), i.e. the phenomenon that a sentence initial argument, when ambiguous with respect to its syntactic function, is preferentially interpreted as the subject of the clause. The „subject preference“ has been observed in a number of typologically different spoken languages and has been assumed to represent a universal processing strategy (e.g. Bornkessel Schlesewsky & Schlesewsky 2009 for an overview). Thus, the finding of a „subject preference“ in ÖGS provides further evidence for the observation that signers and speakers draw on similar strategies during language processing independent of language modality.

The processing of classifier constructions is of great interest with regard to the processing of word order variations for at least two reasons: First, for various sign languages „locative constructions“, i.e. classifier constructions expressing the spatial relationship between objects/referents, have been described. Interestingly, although these sign languages have different basic sign orders they show a common preference for the „locativeobject locative subject locative predicate order” (according to the „Figure Ground principle“) within locative constructions (e.g. Kimmelman 2012 for an overview). Second, previous lesion as well as neuroimaging studiesrevealed that the processing of sign language classifier constructions engage right hemispheric language areas as well as bilateral parietal brain areas to a greater extent in comparison to 1) analogous spoken language constructions and 2) lexical signs (e.g. Corina & Spotswood 2012 for an overview).

To investigate the processing of word order variations with respect to classifier constructions and to test whether the „subject preference“ can also be observed within these structures we conducted an ERP study in which locally ambiguous ÖGS classifier constructions were presented to Deaf ÖGS- signers. In more detail, in these constructions two human arguments were referenced in space by whole entity classifiers (representing either a standing or a sitting person). Thereby, the first argument was always referenced at the left side of the signer by a whole entity classifier which was held in space during the signing of the second argument and during the signing of the classifier referencing the second argument. After both arguments were referenced in space a classifier predicate indicated the relationship between the arguments, i.e. showed who the active person within the construction is. Thus, either the classifier referencing the first argument moves in relation to the argument referenced second (in SOV orders) or the classifier referencing the second argument movesin relation to the argument referenced first (in OSV-orders; see Figure 1).

During the EEG session the Deaf participants (n = 20) had to rate by button press the videos on a scale from oneto seven with respect to the question of whether the seen structure was a good ÖGS- sentence or not (1 stood for ‘that is not ÖGS’; 7 stood for ‘that is good ÖGS’). Data analysis revealed an ERP effect for OSV- comparedto SOV orders with respect to a time point during/when the second argument was referenced in space and/or when the hand referencing the active referent starts to move. With respect to the time point when both arguments were referenced in space, a positivity was revealed within the -100 to 500 ms time window and a subsequent negativity was observed within the 750 to 950 ms interval.

Based on a) the behavioral data which revealed no significant effects, i.e. indicating that there was no preference for either order, and b) the assumption that a sentence initial ambiguous argument is preferentially interpreted as the subject in ÖGS, we interpret the observed effects as enhanced processing costs reflecting reanalysis towards OSV orders. We assume that disambiguation was induced by (a combination of) nonmanual and manual cues occurring during the referencing of the second argument and/or when both arguments are referenced in space and/or by the start of the transitional/path movement of the hand referencing the subject referent. Therefore, the present study reveals two main findings: First, the results provide evidence for the „subject preference“ also with respect to ÖGS classifier constructions (they are not mere gestures). Second, this experiment further suggests that in locally ambiguous ÖGS classifier constructions involving human arguments such as those used in the present study, no „Figure-Ground“ principle is at work (again, not just gestural).

Figure 1. Example representing the two experimental conditions: Both arguments were referenced in space by a classifier handshape (in this case the two referents are placed in space in a way indicating that two persons are standing opposite to one another with more distance between them). Then, either the hand representing the referent which was signed and located in space first (the left hand of the signer; in case of SOV-orders) or the referent that was signed and located in space second (the right hand of the signer; in case of OSV-orders) started to move; i.e. representing the movement of the active referent. The sentence means: “Two girls are standing opposite to one another and one of them (either the one on the left or the one on the right side) is jumping towards the other.

References

Bornkessel Schlesewsky, I. & Schlesewsky, M. (2009). *Processing Syntax and Morphology. A Neurocognitive Perspective.* Oxford: Oxford University Press.

Corina, D. P. & Spotswood, N. (2012). Neurolinguistics. In: Pfau, R., Steinbach M. & Woll, B. (eds.), Sign language. An international handbook. Berlin: Mouton de Gruyter, 739-762.

Emmorey, K. (2002). *Language, cognition, and the brain. Insights from sign language research*. Mahwah, NewJersey: Lawrence Erlbaum Associates.

Kimmelman, V. (2012). Word order in Russian Sign Language. *Sign Language Studies*, *12*(3), 414-445.

Krebs, J., Wilbur R. B. & Roehm, D. (submitted). The processing of word order variations in Austrian Sign Language (ÖGS) - An ERP-study on "subject preference".

Palm-up: It's not all about give and take

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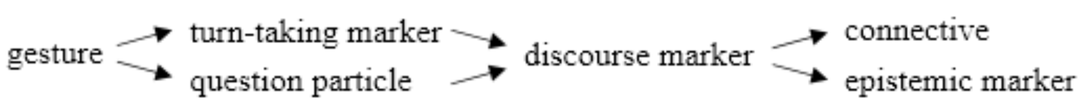
Background. As gestures are used in communicative interactions by deaf signers and hearing speakers, the question arises, in how far these gestures may constitute linguistic elements. Palm- up has been described as a gesture fulfilling various discourse functions in sign and spoken languages (cf. McKee and Wallingford 2011). Considering the use of palm up in sign languages, van Loon, Pfau, and Steinbach (2014) argue for a grammaticalization path from gesture to functional linguistic element as illustrated in (1). In this paper, I present a study on the use of palm up in German Sign Language (DGS) and German and give an alternative account of the grammaticalization of palm-up in DGS which is supported by the empirical data.

(1)



Data. Video data was collected from 20 deaf DGS signers and 10 hearing German speakers of three age groups:group A (17 29 years; 7 DGS signers, 4 German speakers), group B (32 54 years; 6 DGS signers, 3 German speakers), and group C (57 84 years; 7 DGS signers, 3 German speakers). The task involved free interaction between two participants, who were given five questions for pro and contra discussions. The questions were identical for both groups, but presented to the DGS signers by a deaf native DGS signer and to the German speakers by a hearing native German speaker. For the evaluation of palm up, I selected 56 out of 134 minutes ofsigned conversation and 64 out of 177 minutes of spoken conversation. The selection was guided by the following criteria: (i) both participants were equally engaged in the discussion in terms of the amount of turns and (ii) the interviewer did not interrupt the discussion.

Results and Analysis. In sum, 872 occurrences of palm up were identified for the DGS data and 376 occurrences of palm up for the German data. Based on van Loon, Pfau, and Steinbach (2014), all occurrences ofpalm up were assigned to specific discourse functions, which fall under four discourse categories: (i) discourse regulation, (ii) coherence, (iii) stance, and (iv) other. The category of discourse regulation includes interactive functions such as turn taking signals and question markers. Coherence may be achieved by connective and elaborative functions of palm up. Stance is expressed in terms of epistemicity, evaluation, obviousness, and ignorance. Finally, palm-up may serve as a frame for mouthings or as a pointing gesture.

The evaluation of the data firstly shows that the three main discourse categories *discourse regulation*, *coherence* and *stance* not only apply to the use of palm up in DGS, but also to its use as a cospeech gesture in German. It is therefore possible for palm up to occur in similar contexts of either language modality; however, different distributions are observed. DGS signers used palm up most frequently to perform discourse regulation (group A 60 %, group B 53%, group C 63%), while German speakers predominantly used palm up as a co-speech gesture in contexts establishing coherence (group A 54%, group B 50%, group C 40%). The age group of both DGS signers and German speaker appears to not have an impact on the use of palm up for a specific discourse category.

One crucial difference between the use of palm up in DGS and German lies in the ability of DGS to integrate palm up into the sentence structure. The German sentence in (2) is marked for epistemic stance by the modal particle *ja* and the cooccurring use of palm up might further support this reading (cf. Schoonjans 2014). In the DGS example in (3), however, the final palm- up forms a prosodic unit with the previous utterance and is marked by backward body lean and head tilt as well as by eyeblink. In this case, palm up is interpreted as an epistemic stance marker itself indicating the signer's unsureness towards the truth of the utterance.

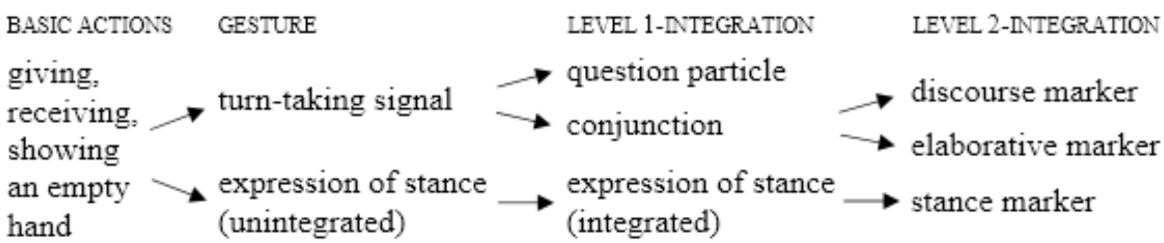
palm-up

(2) Selbst Lebensmittel kannst du ja auch bei Amazon kaufen.
even groceries can you PARTICLE also at Amazon buy
'You can even buy groceries at Amazon, as you know.'

(3) THERE-ARE ALSO SCHOOL-PAM++ IX-3pl PALM-UP INTEREST-LESS PALM-UP
'There also might be students who uhm are not interested.'

Considering DGS, I argue that the sequential integration of palm up into a string of signs facilitates its analysis as a linguistic element along the lines of the grammaticalization path in (4):

(4)



The category *gesture* includes functions of palm up which are used in a similar way by German speakers. As assumed for their use as a cospeech gesture (cf. Müller 2004), their core meaning can be traced back to basic actions of giving and receiving objects (turntaking signals) as well as showing an empty hand to indicate openness to the reception of objects or the fact of not having something (expression of stance, e.g. ignorance). By interpreting the gesture as part of the sentence in DGS, this core meaning is increasingly bleached out, whereas palm-up receives a grammatical function. Level 1-integration includes those functions of palm-up which directly originate from integration into the sentence, while level 2integration involves further prag-matic and grammatical changes characterized by increased subjectivity (discourse marker, elaborative marker) and functionalization (elaborative marker, stance marker). The empirical data of DGS shows three main corre-sponding findings. First, the oldest group of signers uses palm up as a gesture most frequently (71%) as compared to group A (52%) and group B (49%). Second, signers of all age groups utilize palm up as an integralpart of the sentence (level 1- integration) with similar proportions. Third, mostly younger signers (35%) display functions of level 2-integration, whereas they appear least frequently within the oldest group (16%).

Conclusion. In this paper, I provided a grammaticalization account of palm up in DGS, which has its roots in basic actions of giving and receiving objects as well as showing an empty hand. Due to syntactic integration, this core meaning loses its transparency as palm up is associated with linguistic functions and undergoes furtherpragmatic and grammatical changes. This account is supported by the DGS data, which indicates that the subsequent levels of grammaticalization are still visible across different generations of DGS signers.

References

Loon, E. van, Pfau, R. & Steinbach, M. (2014). The grammaticalization of gestures in sign languages. In: C. Müller et al. (eds.), Body language communication. Berlin: de Gruyter, 2131 2147.

McKee, R. & Wallingford, S. L. (2011). 'So, well, whatever'. Discourse functions of palm up in New Zealand Sign Language. Sign Language & Linguistics 14(2), 213-247.

Muller, C. (2004). Forms and uses of the Palm Up Open Hand. In: C. Muller & R. Posner (eds.), The semantics and pragmatics of everyday gestures. Berlin: Weidler, 233-256.

Schoonjans, S. (2014). Gestische Modalpartikeln oder Modalpartikelgesten? In: C. Trautmann et al. (eds.), Interaktionen. Online publication, University of Munich, 91-106.

The emergence of recursion in Nicaraguan Sign Language

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Recursion is a core property of human language, and is characteristic of any rule that can be applied to its own output, such as embedding one string within another. Recursive rules give grammars the power to generate an infinite set of utterances from a finite set of elements. Recursive processes can exist at both the conceptual/semantic level and the syntactic level. *Conceptual*, or *semantic* structure refers to our combinatorial conceptual system, which encodes meaning hierarchically (e.g., Jackendoff, 1990). To interpret the sentence "John knows Mary knows Bill ate bananas" one must represent a knowledge state (John's) that has another knowledge state embedded within it (Mary's) which has yet a third event embedded within it (Bill's banana eating). There is some dispute about whether this conceptual structure is prior to language (in evolution and development) and can be dissociated from it, or, alternatively, whether such recursive meanings are composed within the linguistic system, at an early stage in the syntactic derivation (e.g., Carruthers, 2002). In either case, conceptual structure is contrasted with *syntactic* structure, which refers to the linguistic form used to express conceptual structure, in particular the phrase structure that groups (and embeds) words and phrases in a sentence, and their morphosyntactic properties.

While argued to be a key property of natural languages (Hauser, Chomsky, & Fitch, 2002), at least one language, Pirahã, has been said to lack recursion (Everett, 2005). In the present study, we investigate whether there is evidence of either semantic or syntactic recursion in the sentences of a newly emergent language, Nicaraguan Sign Language (NSL). We ask whether recursive rules are immediately available in the creation of a new language, or if they must be constructed over prolonged historical development.

Before the 1970s in Nicaragua, there were few opportunities for deaf people to interact, and consequently no shared sign language developed. This situation changed abruptly in the mid-1970s, when schools for special education opened in Managua, and deaf children gathered in large numbers. They began to communicate through gestures, and soon a new language emerged that continues to develop. The community has grown from 50 to 1500, with each successive age cohort of children expanding the language and increasing its linguistic complexity (Senghas & Coppola, 2001). This history has created a pattern in which the language produced by older signers represents earlier stages of the language than that of younger signers.

We designed a task to elicit relative clauses, which function to pick out a subset of referents (*the girl who is drawing* from a set of girls), and two control counterparts: conjoined actions, and repeated actions. The relative clause stimuli depicted three similar characters, each performing a distinct action (drawing, painting, knitting). One character then engages in a new action (taking a painting; Fig. 1). The conjoined action stimuli portrayed one character engaged in two actions in sequence (drawing, then taking a painting). The repeated action stimuli portrayed one character engaged in the same action twice (drawing on paper then drawing on an easel pad; Fig. 2).

We tested 27 early-exposed (<6y) signers from three age cohorts of NSL and 4 adult homesigners (data to be coded). Signers' descriptions of relative clause stimuli, conjoined actions, and repeated actions were compared. For relative clauses, we expected participants to describe all three characters, and signers in all cohorts generally did so (C1: 60%, C2: 73%, C3: 77%, p=.133). Next, we coded whether signers fulfilled the semantic function of a relative clause by producing an utterance with the referent followed by two verbs (e.g., GIRL DRAWING TAKE PAINTING). Signers in all three cohorts did this consistently (C1: 97%, C2: 98%, C3: 100%, p=.338). Finally, we considered a form-based distinction of syntactic recursion: whether the embedded verb (TYPING) might be reduced in length. First, we coded whether signers repeated the identifying verb before describing the new action (e.g., GIRL <u>DRAWING,</u> GIRL PAINTING, GIRL KNITTING, GIRL <u>DRAWING</u> TAKE PAINTING). First-cohort signers were less likely to repeat the verb than second- and third-cohort signers (p<.01). We tested for reduction of the second use of the verb relative to the first use, and found a reliable pattern of reduction in the later cohorts (p=.039). Follow-up comparisons showed a marginally significant difference between the first and second cohorts (p=.077), a significant difference between the first and third cohorts (p=.014), and no difference between the second and third cohorts (p=.354). In contrast, for non-embedded repetition in the repeated verb version, there was no reduction in the length of the second verb (p=.807). Preliminary results suggest that other lexical items appear between the two verbs more frequently in conjoined clauses (e.g., GIRL DRAWING IDEA BAD NAUGHTY WALK TAKE PAINTING) than in relative clauses (e.g., GIRL DRAWING TAKE PAINTING) for all three cohorts. Thus even first cohort signers may differentiate between the two types of structure.

These findings suggest that signers from all cohorts have strategies to fulfill the discourse function of relative clauses, suggesting that the semantic notion of a predicate embedded in a referential phrase (the NP) is available to signers from the outset. Over generations, the grammatical form develops and changes, with newer learners of the language producing sentences that include prosodic reduction, a hallmark of embedding constructions.

Figure 1. Example relative clause stimulus. Each individual performs a different action (e.g., drawing). The bottom left panel depicts all three characters. The bottom right panel depicts one of them engaged in a second action (e.g., taking down a painting).

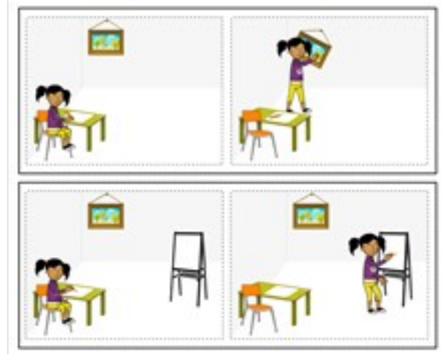

Figure 2. The top panel depicts an example of a conjoined event stimulus. The bottom panel depicts an example of the repeated event stimulus.

References

Carruthers, P. (2002). The cognitive functions of language. *Behavioral and Brain Sciences*, *25*, 657-674.

Everett, D.L. (2005). Cultural constraints on grammar and cognition in Pirahã. *Current Anthropology*, *46*, 621-646.

Hauser, M. D., Chomsky, N., & Fitch, W. T. (2002). The faculty of language: what is it, who has it, and how did it evolve? *Science*, *298*, 1569-1579.

Jackendoff, R. (1990). *Semantic structures*. Cambridge, MA: MIT Press.

Senghas, A., & Coppola, M. (2001). Children creating language: How Nicaraguan Sign Language acquired a spatial grammar. *Psychological Science*, *12*, 323-328.