Segmentation in sign languages

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Introduction

The aim of this paper is to discuss different levels of segmentation considering linguistic analyses of sign languages. These levels of segmentation include the (1) sign gloss by sign gloss; (2) the utterance, based on each statement; (3) the single syntactic unit with any number of embedded clauses; (4) the smaller syntactic/pragmatic components. Each level of segmentation will be presented considering specific criteria: prosodic, semantic, and syntactic (predicate-argument structure).

Corpus data

The segmentation of sign languages focused on in this presentation was proposed based on data from two sign language corpora: the Swedish Sign Language Corpus and the Brazilian Sign Language Corpus.

- Annotations from conversation settings of eight Deaf people, four from each country, each one an interactive setting in pairs.
- Conversation is a setting that involves more spontaneous production about Deaf community and culture, without previous planning.
- This kind of setting needs additional criteria for segmentation to be analyzed at different levels of linguistic analysis.

How to segment an utterance?

An utterance is a full proposition, and is a segment including formal marks such as intonation and pauses in association with the context in which it is produced.

- A syntactic component is expressed through a predicate (verbal or nominal).
- Each predicate is separated in this specific component. Following Börstell et al. (2016:19), we define a clause "a clause as a unit in which a predicate asserts something about one or more elements (the arguments)."
- The base of the clause is driven by syntax, while the utterance is driven by meaning.
- A full proposition can have more than one syntactic component.
- In both cases, prosody is taken into account. Prosody includes non-manual markers, pauses, body or gaze shifting, blinks and head nodding (as analyzed for Finnish Sign Language and Swedish Sign Language, in Puupponen et al. 2016, see also Fenlon et al. 2007)
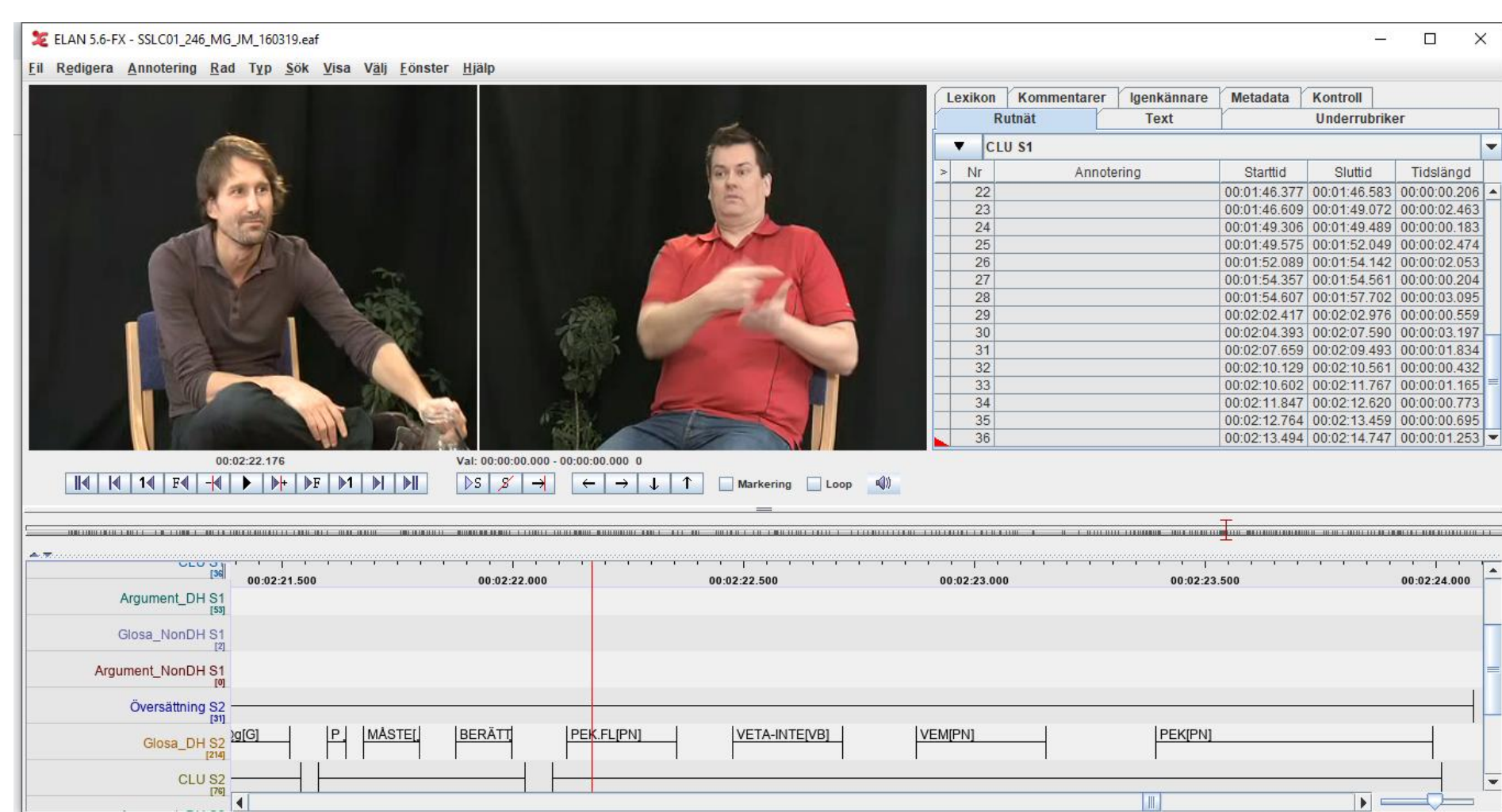
An example on segmentation

The examples illustrate the criteria established for both languages; Svenskt teckenspråk (STS) and Língua Brasileira de Sinais (Libras)

STS (SSLC01_246 00:02:18.500-00:02:24.090)
One utterance, four syntactic components

Utterance:
TO DEAF YOUNG POINT.PL YOUNG PRO1 OLDER PU PRO1 MUST TELL POINT.PL KNOW-NOT WHO POINT
Syntactic components:
TO DEAF YOUNG POINT.PL YOUNG / PRO1 OLDER PU / PRO1 MUST TELL / POINT.PL KNOW-NOT WHO POINT

Translation:
When I, a little older, meet deaf young people, I usually tell them about him, they usually do not know who he is.

STS (SSLC01_246 00:01:12.936-00:01:15.756)
One utterance, two syntactic components

Utterance:
IMPORTANT GET SIGN-LANGUAGE GRAMMAR (facial expression) EFFECT
Syntactic components:
IMPORTANT GET SIGN-LANGUAGE GRAMMAR / (facial expression) / EFFECT

Translation:
It is important to acquire sign language grammar, it is a wow experience and a good start.

References

Börstell, C., Wirén, M., Mesch, J. & Gärdenfors, M. 2016. Towards an annotation of syntactic structure in the Swedish Sign Language Corpus. Proc. of the 6th Workshop on the Representation and Processing of Sign Languages: Corpus Mining (LREC)], Portorož, Slovenia, 28 May 2016. (pp. 19-24). Paris: European Language Resources Association (ELRA).
Fenlon, J., Denmar, T., Campbell, R. & Woll, B. 2007. Seeing sentence boundaries. Sign Language & Linguistics, 10(2), 177-200.
Puupponen, A., Jantunen, T., & Mesch, J. 2016. The alignment of head nods with syntactic units in Finnish Sign Language and Swedish Sign Language. In: Proceedings of Speech Prosody 2016 / [ed] Jon Barnes, Alejna Brugos, Stefanie Shattuck-Hufnagel, Nanette Veilleux, 2016, 168-172 p.
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Libras (FLN_G1_D1_CONVER_Escolasurdoouvinte 00:00:01:000-00:00:10:000)
One utterance, three syntactic components

Utterance:
SCHOOL INCLUSION HARD BECAUSE THERE-IS-NO THINKING KNOW DEAF CULTURE RIGHT?
Syntactic components:
SCHOOL INCLUSION HARD / BECAUSE THERE-IS-NO THINKING KNOW DEAF CULTURE / RIGHT?

Translation:
The inclusive school finds some difficulty, because there is no knowledge of deaf culture, isn't it?

Libras (FLN_G3_D6_CONVER_Escolasurdoouvinte
One utterance, three syntactic components

Utterance:
POINT.PL STUDENTS HEARING TALK PRO1 DEAF DV(stay-static) HELP NOTHING
Syntactic components:
POINT.PL STUDENTS HEARING TALK / PRO1 DEAF DV(stay-static) / HELP NOTHING

Translation: The hearing students talk to each other, while I, a deaf child, stay still observing without help (to communicate) from the others.

Discussion

For syntactic analysis, we can consider multiple syntactic units for studying different sentence levels of only one syntactic phrase or more, including different scopes of the clause (such as a verbal phrase, a nominal phrase, an adverbial phrase, an adjectival phrase, a topic phrase, a focus phrase, or a complement phrase).
The purpose of establishing the same criteria for segmentation is to make possible corpus-driven and comparative studies among sign languages.

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