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### **Slicing Your SL Data into Basic Discourse Units (BDUs). Adapting the BDU Model (Syntax + Prosody) to Signed Discourse**

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# SLICING YOUR SL DATA INTO BASIC DISCOURSE UNITS (BDUs) ADAPTING THE BDU MODEL (SYNTAX + PROSODY) TO SIGNED DISCOURSE

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## TO START WITH.....

### Background

- Discourse segmentation is at the basis of how oral discourses are structured
- The traditional concept of sentence does not take into account interjections, discourse markers (DMs), etc. that appear in oral data, so different models have been created to segment spoken discourse
- No model for the segmentation of SL discourse

### Our need

- A segmentation model for SL data that allows us to segment in a consistent way both monologic and dialogic corpus data
- To study the position of DMs in French Belgian Sign Language (LSFB)

### How?

- Adapting a consolidated model such as the **Basic Discourse Units (BDU) Model** (Degand & Simon 2005, 2009ab) to the signed modality.
  - Delimit syntactic units (i.e. clauses) on the basis of Dependency Grammar
  - Delimit prosodic units according to a set of acoustic cues: a silent pause (longer than 250 ms), lengthening of the syllable (three times longer than the syllables in context) or a sharp rise of f0 (intra-syllabic f0 superior to ten semi-tones)
  - Establish BDUs where syntactic and prosodic boundaries coincide
- The first and second steps are independent

## METHOD.....

### LSFB Corpus (Meurant 2015)

- 6 signers : balance in terms of age (2 belonging to each of the following age groups: 18-29, 30-49 and 50-80) and gender (3 ♂ and 3 ♀)
- Dialogues: (42'45"): narration of a past memory and argumentation on deaf issues
- ELAN

SyU + PrU = BDU

## USING THE BDU MODEL TO GET SLICED SL DISCOURSES.....

### Following the principles of DEPENDENCY GRAMMAR for spoken French as conceived by Blanche-Benveniste et al. (1990)

- Verbal dependency clauses** → the verb is the nucleus  
[I BUY LAND WITH HEARING]  
[I bought a land with a hearing person]'
- Averbal dependency clauses** → another element (pronoun, noun or adjective) is the nucleus  
[BANK DIFFICULT MONEY RECEIVE]  
[it was difficult to get money from the bank]'
- Elliptical dependency clauses** → incomplete clauses that can be interpreted as averbal dependency clauses when referring to the context  
S045: [IRSA WOLUWE TEAM AGAIN PLAY AGAIN] S[FOOTBALL PLAY AGAIN] [LESS]  
S044: S [THAT EVERYDAY] [LESS]  
S045: [the teams at IRSA and Woluwe still play] [they still play] S[they still play football] [less]'  
S044: S[not everyday] [less often]'
- Interrupted clauses** → an obligatory element is missing or the clause is not finished  
S056: [FEEL]-I  
S055: [FEEL MORE DEAF] S<PALM-UP> [BECAUSE PERSON-BLOW]-I [YES] [THAT-S-IT]  
S056: S[YES] <PALM-UP> [GIVE] [YES] <PALM-UP>  
S056: [I feel]-I  
S055: [you feel more deaf] S<don't you> [because I realised]-I [yes] [that's it]  
S056: S[yes] <erm> [it makes me feel] <yeah>'
- Clauses with a nondependent element** → the clause contains an adjunct  
[START SCHOOL GO-UP SCHOOL UNIL TIME\_TEN] <AFTERWARDS> [PLAY FIFTEEN MINUTES]  
[when it was the time to start school we went upstairs until ten o'clock] <afterwards> [we played for fifteen minutes]'

Hide the SyU tier before starting prosodic segmentation

### Adapting the acoustic cues to visual cues, i.e. "boundary markers" that segment discourse into rhythmic units because they are punctual in nature (Pfau & Quer 2010)

- Pauses** (= pauses) → periods of no signing at all with the hands along the body, crossed or in the neutral space as in Figure 1
- Sign holds or lengthened signs with respect to the context** (= lengthening of a syllable) → a sign hold appears when the handshape of a sign is frozen, and a lengthened sign appears when the movement of the sign is slowed or exaggerated
- Eye blinks layered with another prosodic cue** (head nod, a change in gaze, a shrug, etc.) (= sharp rise in f0) → widely acknowledged a prosodic function of marking boundaries (Wilbur 1994, Brentari & Crossley 2002, Crasborn et al. 2004, Sze 2008, Herrmann 2010)

(Watch the videos)

When prosodic segmentation is finished, display the SyU tier



Figure 1. Types of pauses

### Finding the convergence point between syntactic and prosodic units

Different types of BDUs as in the original model:

- Congruent** → syntactic and prosodic boundaries coincide (cf. second BDU in Figure 2)
- Syntax-bound** → a syntactic unit contains several prosodic units  
SyU [ ]  
PrU [ ] [ ] [ ]
- Intonation-bound** → a prosodic unit contains several syntactic units (cf. third BDU in Figure 2)
- Regulatory** → the BDU is an adjunct or a DM  
DM  
SyU [ ]  
PrU [ ]
- Mixed** → there are several syntactic and prosodic units within the BDU before the boundaries coincide (cf. first BDU in Figure 2)

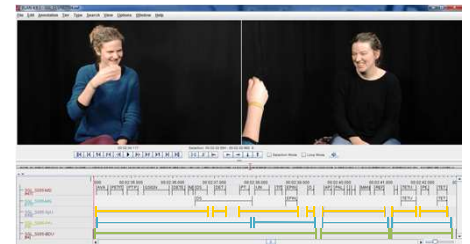


Figure 2. A mixed BDU, a congruent BDU and an intonation-bound BDU

## 3 Establishing BDUs

## SERVING IDEAS.....

### Studying of the position of SAME when it works as a DM

- Articulation: the indexes of both hands extended get in contact with an inward movement as in Figure 3
- Core meaning of resemblance or similarity, but very productive in natural discourse as a DM
- Same position for the most common functions: addition (adding information to the same topic as in example 1) and specification (introducing an example as in example 2)



Figure 3. SAME

- [HEARING I GO BICYCLE LEARN] [BICYCLE THERE GO] /// <SAME> [GO HORSE] [I GO HORSE]  
[the Hearing taught me how to cycle] [I went cycling] /// <and> [I went to ride horses] [I rode horses]'  
☞ **SAME**: out of the dependency structure of the third clause containing the verb GO (i.e. clausal left periphery), but prosodically integrated at the beginning of the second BDU (i.e. syntactic left periphery).
- [YES] <SAME> [REMEMBER BEFORE LITTLE ALWAYS I] [TODAY SECOND MEMORY CHILD]  
[yes] <for instance> [I remember when I was young] [this is my second childhood memory today]'  
☞ **SAME**: out of the dependency structure of the verb REMEMBER (i.e. clausal left periphery), but prosodically integrated in the middle of the BDU (i.e. BDU medial position)

## TO END WITH.....

- Segmenting with this adaptation of the BDU Model is time consuming, but allows a more fine-grained study of the position of DMs in the signed modality and answers to a controversial issue in SL research such as the segmentation of SL corpus data
- The coupling of position and function of SAME is regular across different examples of our corpus, so the position can be used to identify the function of a polysemous DM such as SAME, whose annotation strongly depends on the annotator's interpretation
- The study of the left periphery could give insight on (among others):
  - the assumption that SLs prefer constructions of topicalization
  - whether SLs prefer implicit discourse relations over explicit discourse relations
  - the discourse features that define a formal vs. an informal speech
  - the devices preferred in a monologue over a dialogue

Just try it and let us know!

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