



Identifying *continuers* in the Swedish Sign Language Corpus

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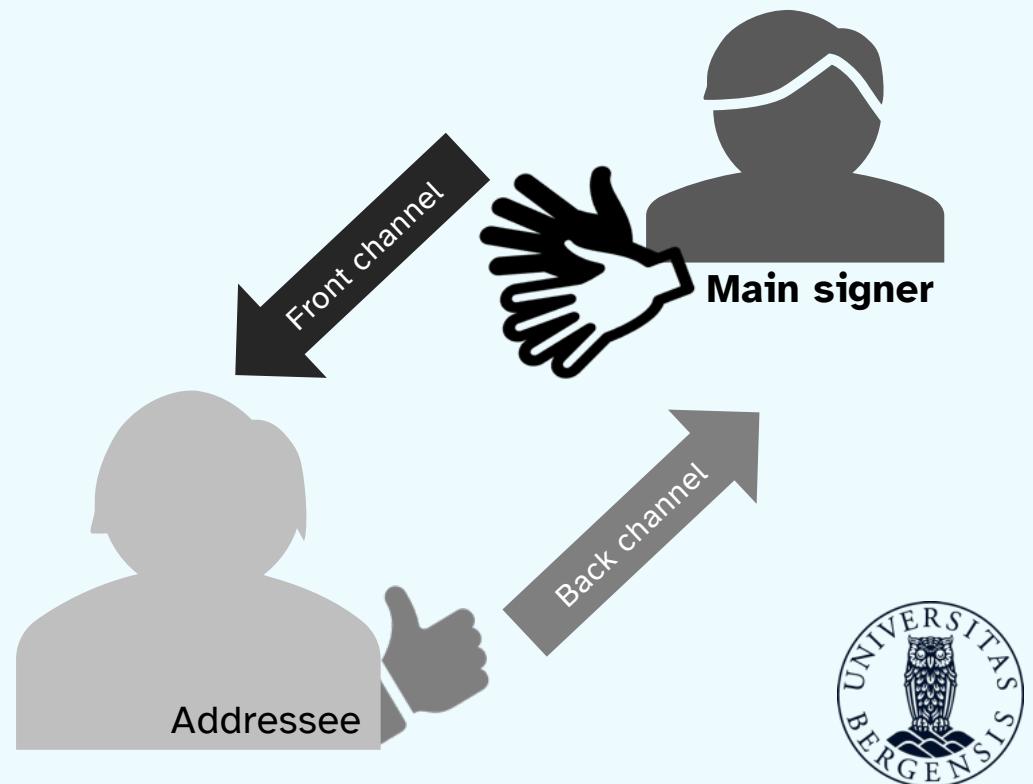


Introduction



Backchanneling

- Backchanneling is a **conversation-regulating** device
- Direct **feedback** to the main speaker/signer (from addressee)
- Signals **comprehension** (not necessarily agreement)



Feedback: continuer or assessment

Continuer



Assessment

- **Signals understanding**
- **Encourages** primary speaker/signer to **continue**
- English: “***uh-huh***”
- **Specific feedback**
- Adds a **comment** about the content
- English: “***yuck!***”, “***wow!***”

(Goodwin 1986)



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Feedback: continuer

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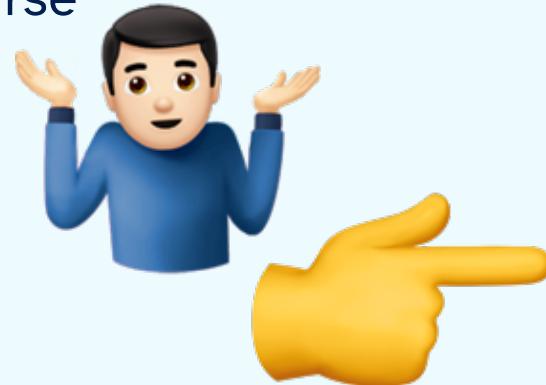
(Goodwin 1986)



Conversation-regulating signs

- There has been some previous work on *specific signs* used for **regulating conversations** and discourse

- **PALMS-UP**
- **pointing signs**
- ...



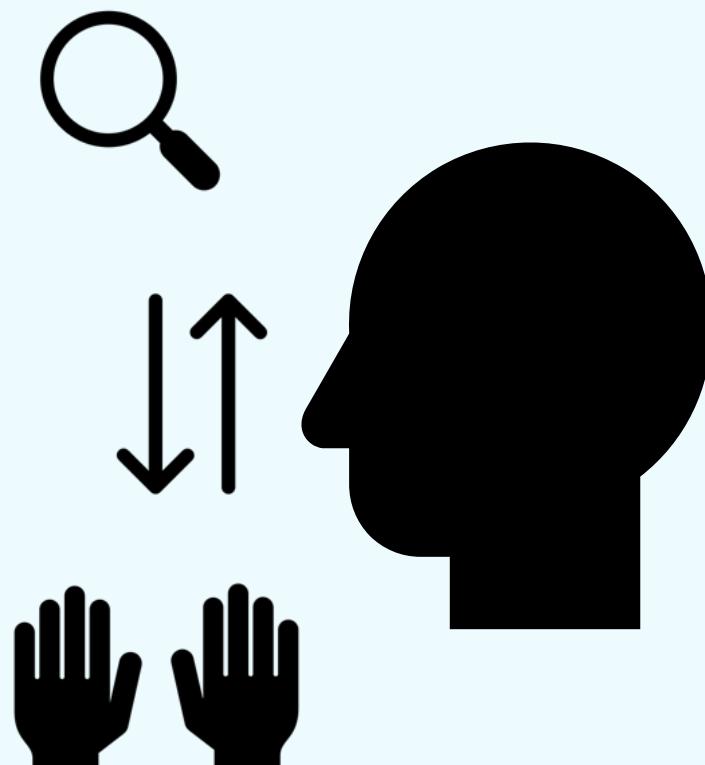
- These signs have many functions, but can regulate aspects of **backchanneling**, interrogatives, turn-taking and referent tracking



(Vogt-Svendsen & Bergman 2007; McKee & Wallingford 2011; Gabarró-López 2020; Lepeut & Shaw 2022; Arnold & Ferrara 2024)

Non-manual backchannels?

- What is missing here are **non-manual backchannels**
 - **Head nods** are used and can mean both 'yes' and 'uh-huh'
- ... in this study, I focus **only on the manual signs** ☹

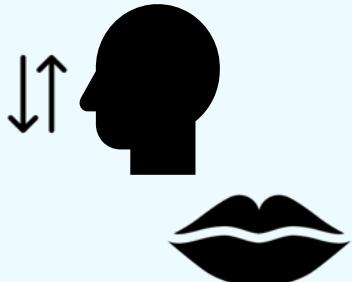


(Bauer et al. 2024; Lutzenberger et al. 2024)

Backchanneling in Swedish Sign Language (STS)

- Mesch (2016) looked at a 35-minute of the **STS Corpus**
 - Manually annotated **all instances of backchannels** in conversation
- The most common **non-manual backchannels** were:

- **Nodding**



- **Mouthing**



(Mesch 2016)

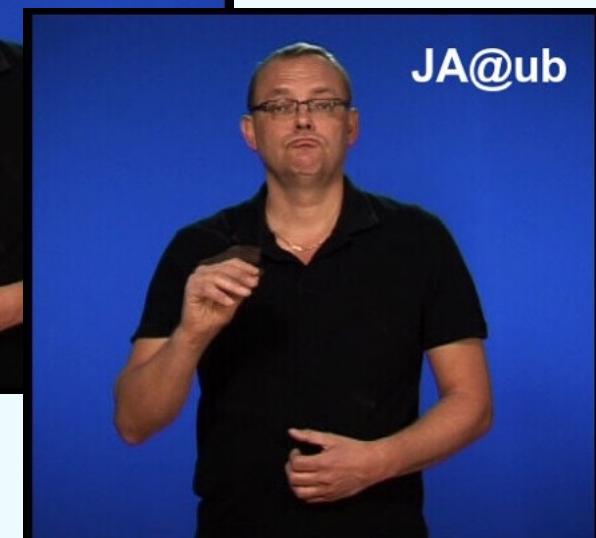
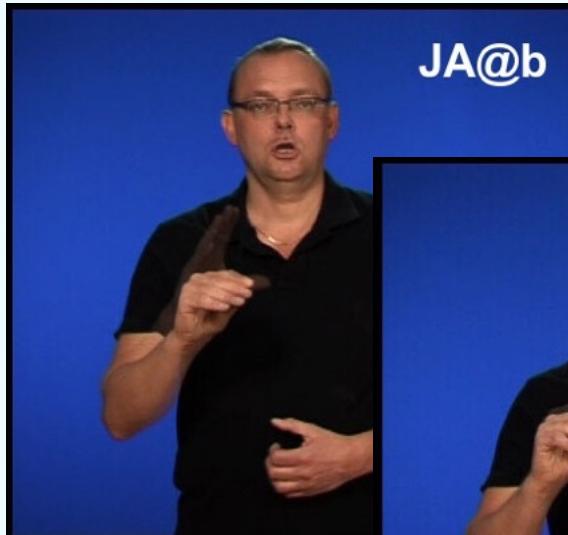


Backchanneling in Swedish Sign Language (STS)

- The most common manual backchannels were:

- **JA@b / JA@ub:** 'yes' →

- **PU@g:** *palms up*



(Mesch 2016; Svenskt teckenspråkslexikon 2024)



... many types of backchannels in STS!



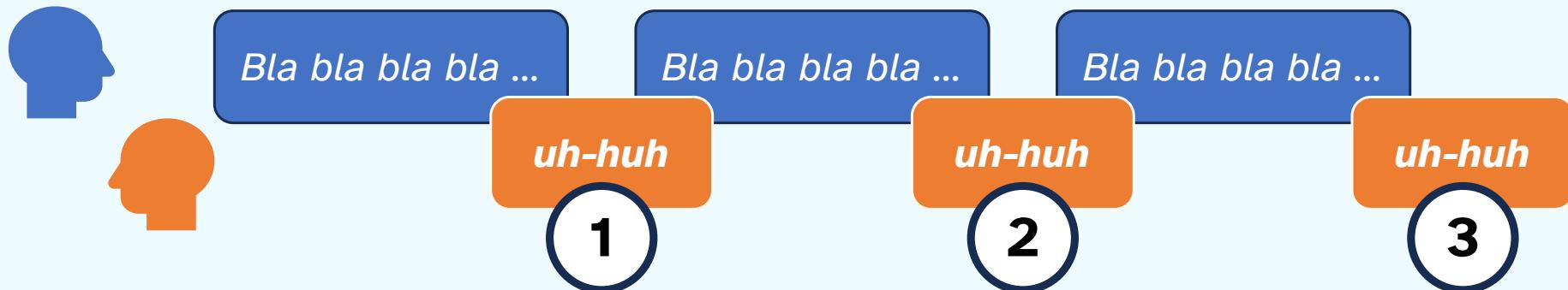
(Öqvist et al. 2020, teckensprakskorpus.su.se)

*If we want to **identify continuers** in
a language, how do we do that?*



A language-agnostic method

- Dingemanse, Liesenfeld & Woensdregt (2022) introduced a method to **identify continuers based on distributional patterns** in conversation



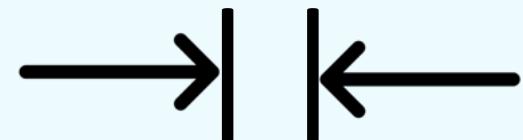
Streak of 3 identical turns



(Dingemanse, Liesenfeld & Woensdregt 2022)

Continuers: what to expect

- Continuers should be **easy to produce**
 - short & simple
- Continuers are often **reduplicated**
 - often contain **nasals** in spoken languages
- Continuers should be **unobtrusive**
 - **not interrupt** the conversational flow



mhm



Research questions:

1. *Can **continuers** in STS be found from **distributional patterns**?*
2. *Are there distinct **form-properties** associated with **continuers** in STS?*



Methodology



Datasets

- I used the **entire STS Corpus** to try to **identify continuers** based on **distributional** patterns
 - The STS Corpus: **24 hrs** of dyadic conversations & narratives
 - **~190,000** annotated sign **glosses**; 42 signers
- I used a **subset** of the STS Corpus to look at **form-properties** of signs using the computer vision software **MediaPipe** on the video data
 - Subset: **2 hrs 45 mins** of conversational data with 30 signers
 - 13,507 annotated sign glosses

(Öqvist et al. 2020; Lugaresi et al. 2019)



STS Corpus



Signer 1: Dominant hand
Signer 1: Non-dominant hand

Signer 2: Dominant hand
Signer 2: Non-dominant hand

TID-BAKÅT ('time past')

FÖRUT ('before')

JA@ub ('yes')

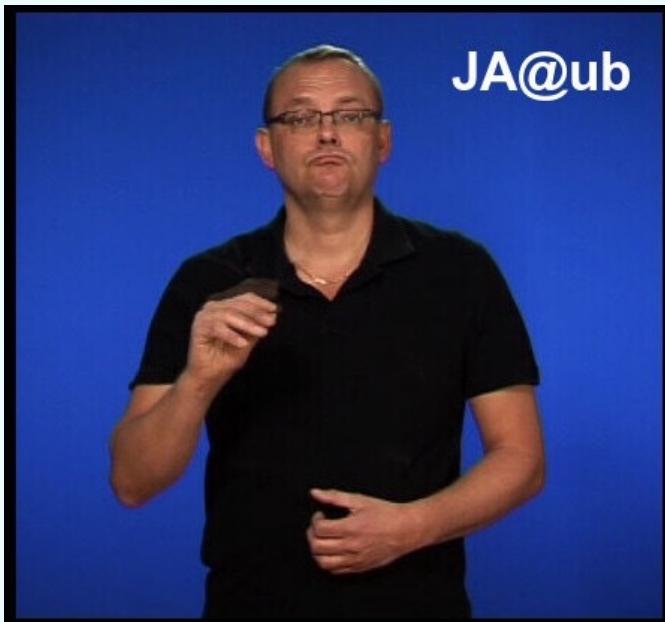


Distributional patterns: streaks



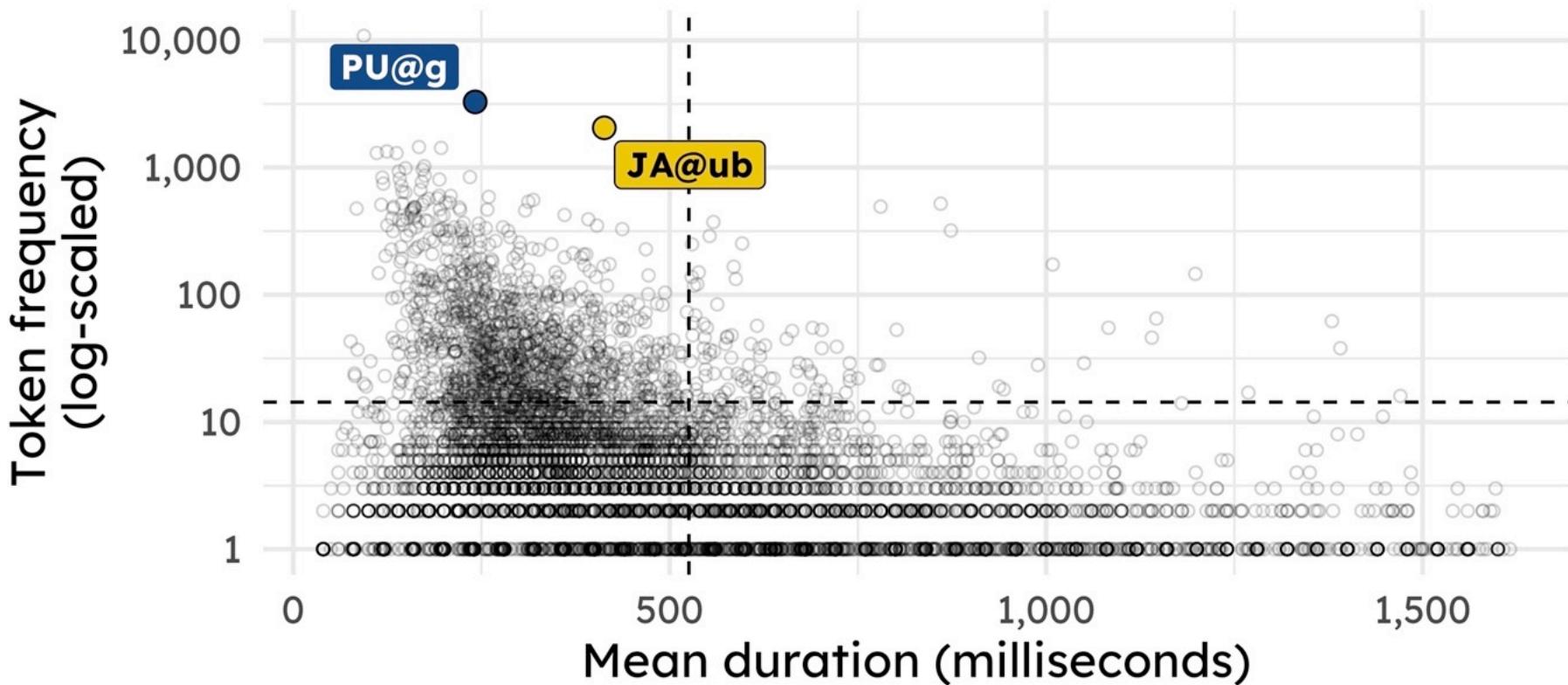
Identifying streaks

- Which signs were identified in continuer streaks?



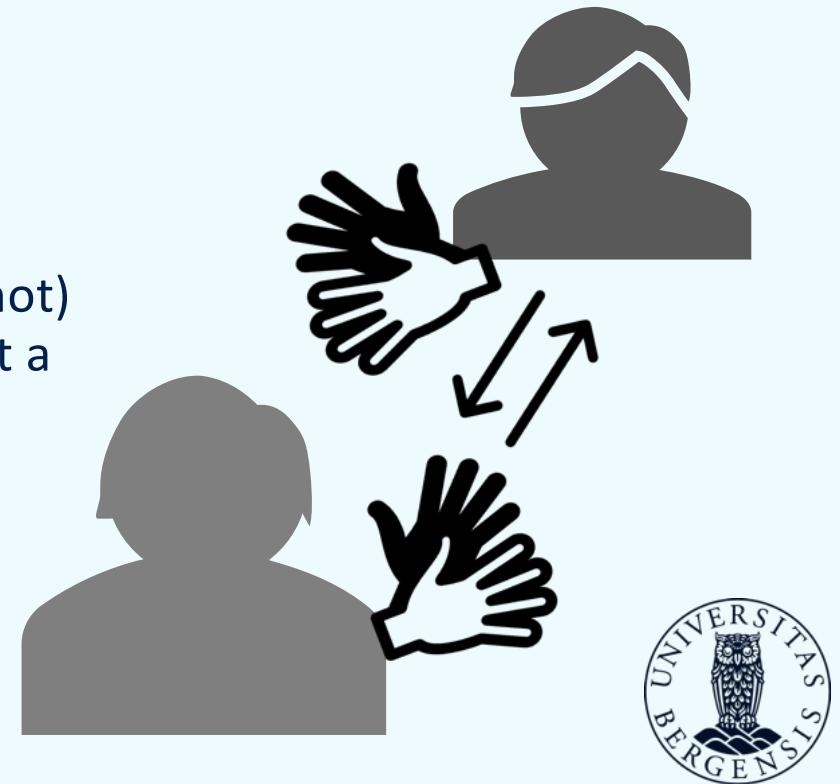
Frequency-duration of continuer candidates

Mean duration and token frequency of all signs



Second method: overlaps & turns

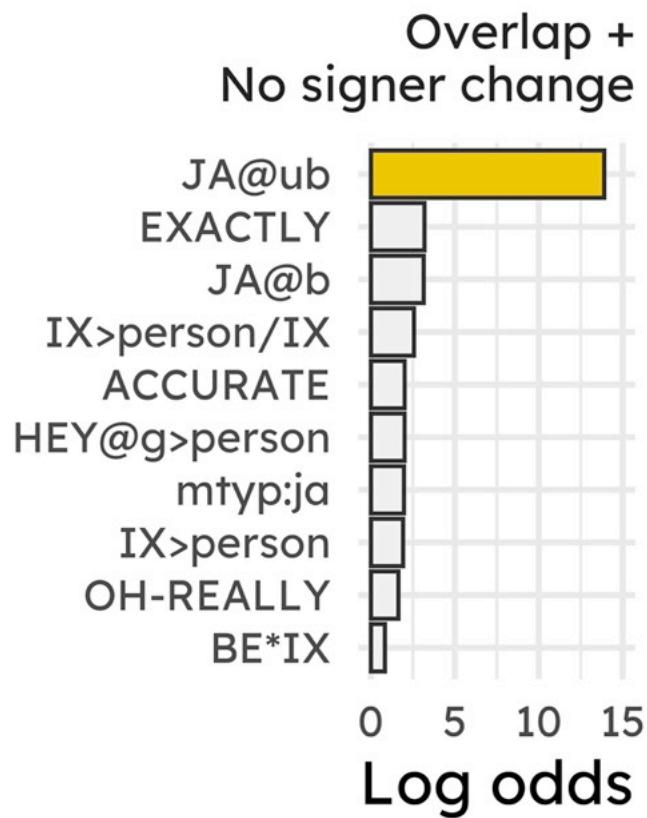
- I adopted a second distributional approach
 - The **contexts of signs** in the STS Corpus
- I categorized signs as either **overlapping** (or not) with the other signer, and if the sign occurs at a **point where the (main) signer changes**
- **Continuers** would be expected to show up at overlapping + no change



Distributional patterns: overlap & turns



Overlap & no signer change

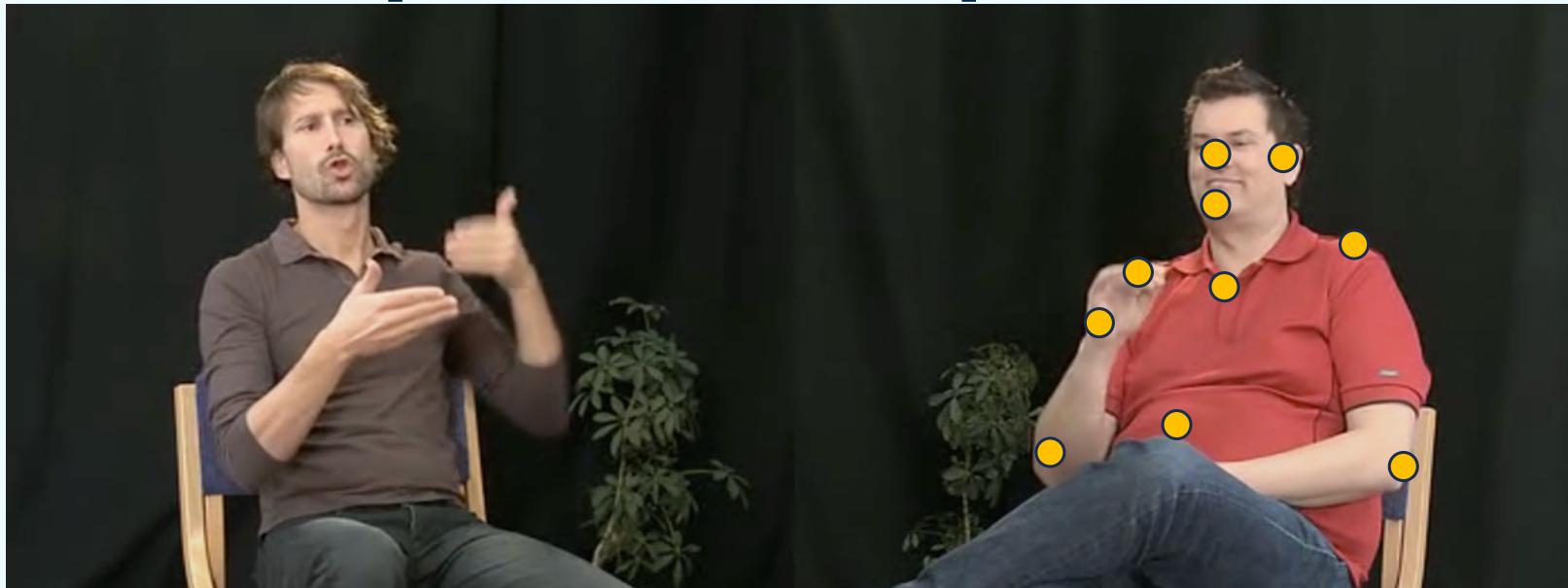


(Schnoebelen et al. 2022)

Computer vision approach



STS Corpus: MediaPipe



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STS Corpus: MediaPipe



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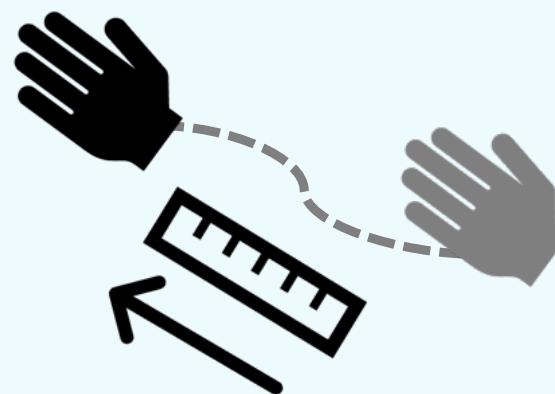
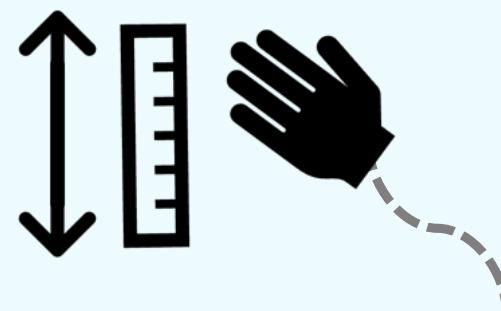
FÖRUT ('before')

JA@ub ('yes')



MediaPipe data analysis

- I look at the **sign height**
 - **how high the hand is** in signing space compared to the average
- I look at **distance traveled**
 - **how far the hand + fingers** of the articulating hand **move** across frames

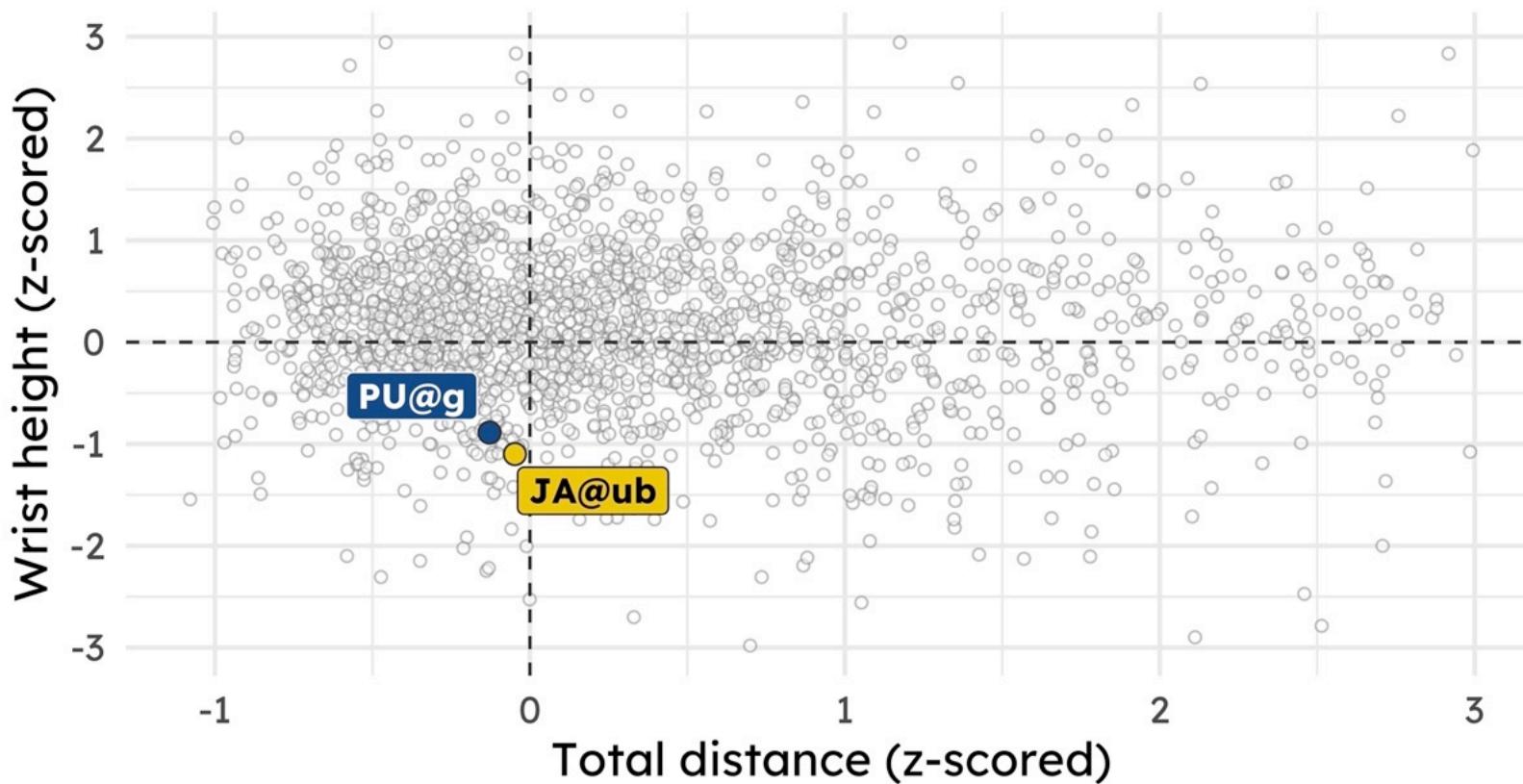


Results



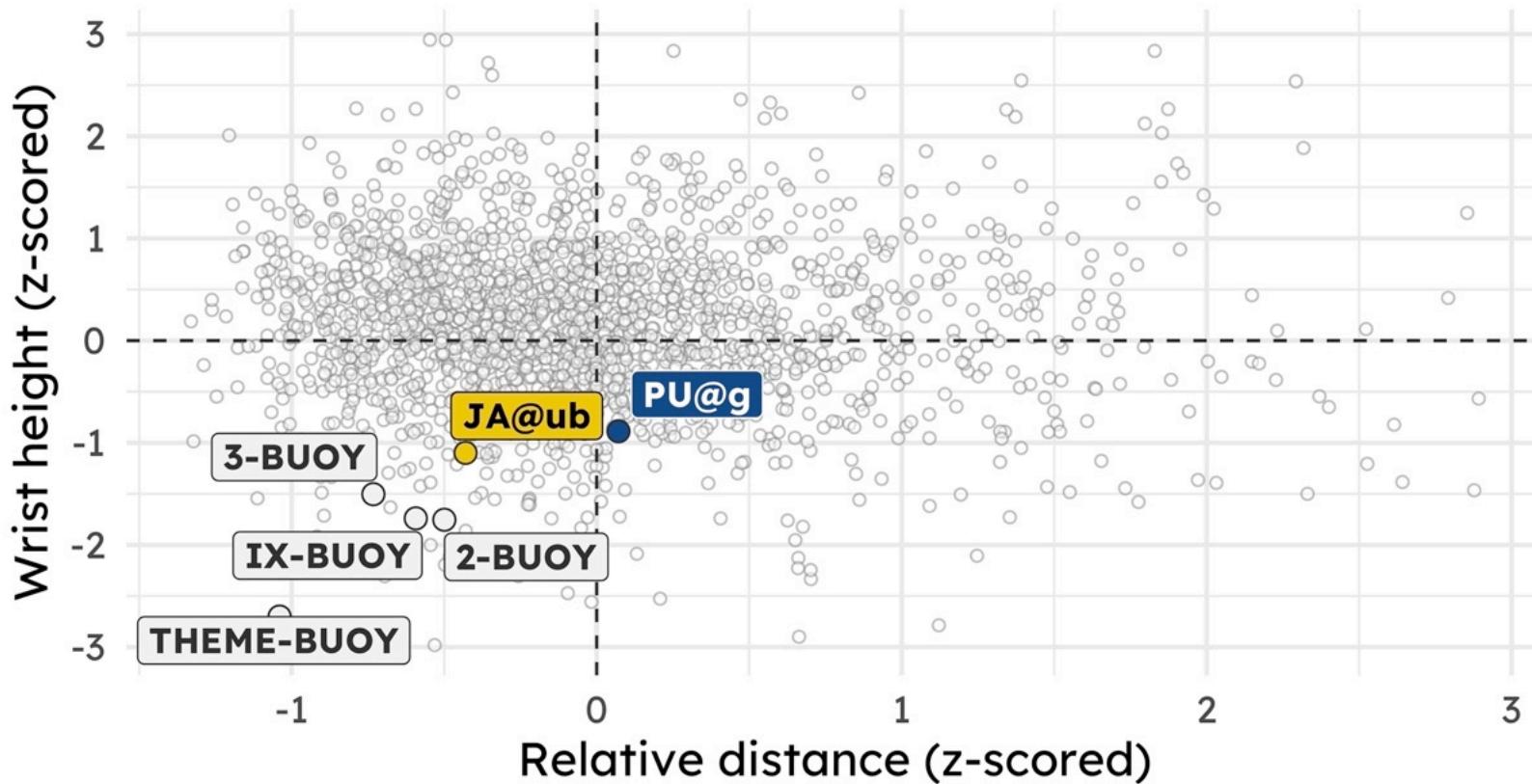
Form properties of continuer candidates (absolute)

Hand height and total distance traveled



Form properties of continuer candidates (relative)

Hand height and relative distance traveled



Discussion & conclusions



Conclusions

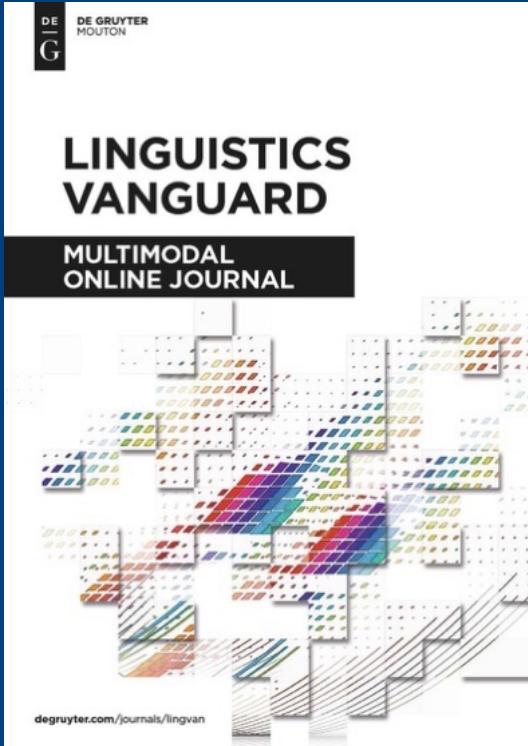
- **Continuers can be successfully identified** in signed conversations, too, based on **distributional patterns**
 - A combined approach with both **streaks and context-based** frequencies may be helpful – singled out the more **dedicated** form
- **Manual continuers** in STS are **longer than expected** in duration, but are articulated **lower in height** and with **less relative movement**
 - Makes them **frequent, efficient and unobtrusive**
 - **Reduplicated form** mirrors findings from spoken languages!



Final remarks

- Modality-specific patterns?
 - The modality may allow for longer signs
...**visual overlap may be less obtrusive**
(than acoustic)
- What's **missing from this study?**
 - The **non-manual** expression of backchannels!





Read more!

This study has already been published in *Linguistics Vanguard*, so you can read that paper for more details!

Börstell, Carl. 2024.

Finding continuers in Swedish Sign Language.

Linguistics Vanguard. doi: [10.1515/lingvan-2024-0025](https://doi.org/10.1515/lingvan-2024-0025)



Thank you!

Tusen takk!

ՀԱՇՊԱՆՑ!

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