Applying phonology in lexicography: variant-synonym classification in Czech Sign Language

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1. Problem

This poster focuses on the **variant/synonym classification** in the first online lexical database of Czech SL (*Dictio*), as part of the lemmatisation problem. **Lemmatisation issuses** for sign languages are more similar to those of spoken langauges that lack standard writing systems than that with standard orthographies (Fenlon et al. 2015). Researches have noted that a **pair of signs is likely to be variants** in case they **differ in just one parameter** (Fenlon et al. 2015). Parameters (in SL: hand configuration, place of articulation, movement) may act as **phonemes** and create minimal pairs (🤌BAR and 🤌BRNO differ only in one parameter: hand configuration → orientation). Thus the starting point in the variant/synonym classification is to affirm that the lexemes share the same meaning. We are using the Hand-Tier (H-T) model (Sandler & Lillo-Martin 2006; S&LM) due to its fitting description of the data we are working with. Other phonological models such as Move-Hold model (Liddell & Johnson 1989) or Brentari's (1998) Prosodic model cannot accurately capture the subtle contrasts important in this lexicographic task.

Our research contributes the following: a) **empirical** level: phonological description of (deeply understudied) Czech SL – at the moment, we build on a study of **300 phonologically related pairs** of variants/synonyms; b) **practical** level: classification of Czech SL lexemes in *Dictio* (resolving a part of **lemmatisation issues** in the dictionary); c) **theoretical** level: refinement of the requirement for **minimal difference** in SL variants. We specify what is covered by the "one parameter" criterion. Additionally, we work out the exact position and function of the **features [rep] – repetition and [contact]** in the H-T model, and, in consequence, we update the model for the secondary movement.

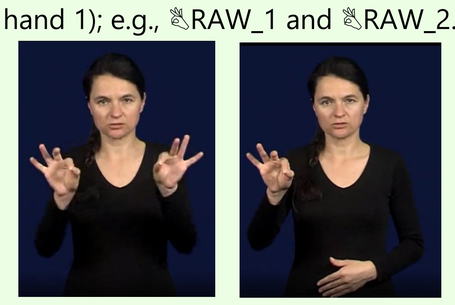
2. Model

Non-dominant hand: Sandler (1995) lists the unmarked handshapes for ASL. No research for Czech SL yet.

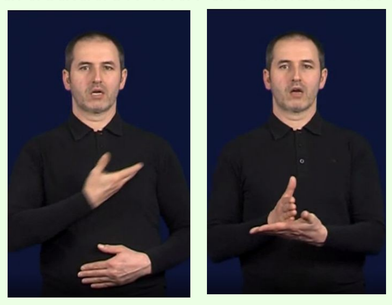
Different number of hands

We classify the pairs that result from the weak drop as having a different place. Weak drop is a postlexical process observed by non-symmetrical two-handed signs that consist in the deletion of the non-dominant hand (hand 2 → neutral place); e.g.,🤌VIDEO_1 and 🤌VIDEO_2

Symmetrical two-handed signs and their one-handed variants differ in the engagement of hand 2 (copy of hand 1); e.g., 🤌RAW_1 and 🤌RAW_2.

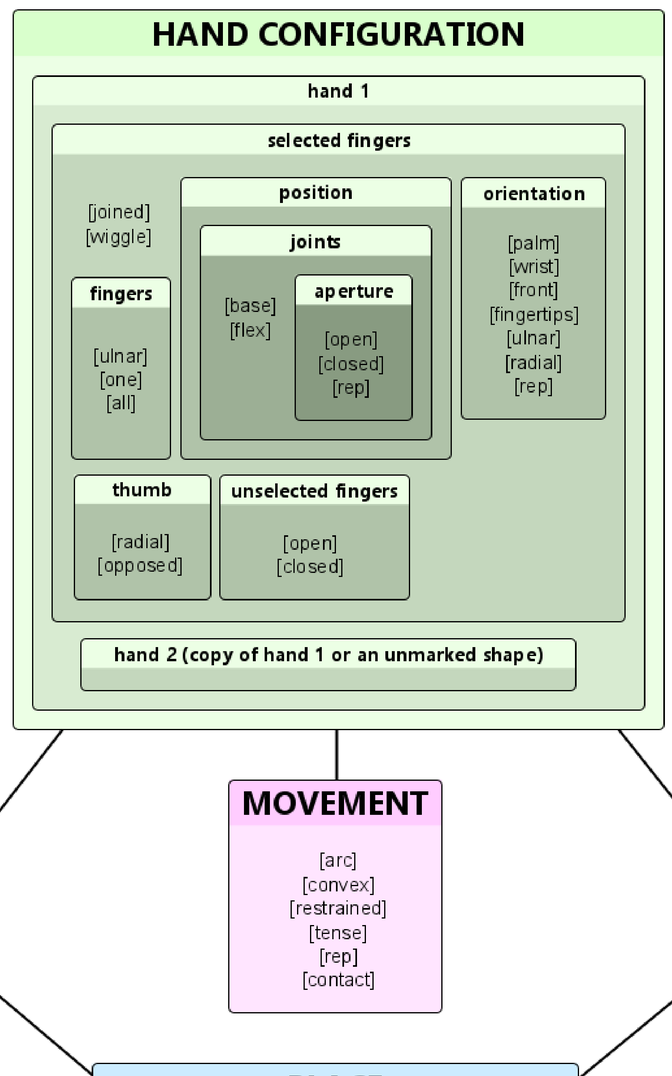


Orientation of the hand is always evaluated with respect to the place of articulation: variants 🤌BROTHER_IN_LAW_1 and 🤌BROTHER_IN_LAW_2 do not differ in orientation, since in both cases, the dominant hand contacts the place of articulation with the ulnar side.



Following S&LM, we analyze **circular movement** as a combination of [arc] and [convex] features.

The **terminal features** are taken from S&LM.

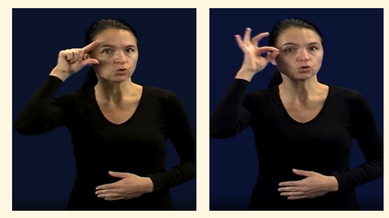


The feature **[contact]** can appear on ***movement*** (e.g., 🤌NUDE), ***place*** (e.g., 🤌REMEMBER), or explicitly on a location, if specified (e.g., 🤌TRUTH).

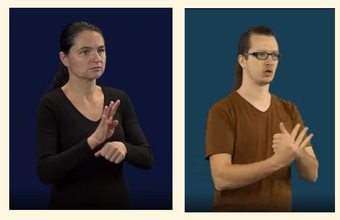
Refinement of one parameter criterion: variant-pairs with more than one different value within a single parameter

3 differences within ***HC***: 🤌TUNISIA_1 (position of fingers: [open], [closed], [rep], unselected fingers: [closed]) and 🤌TUNISIA_2 (position of fingers: [closed], unselected fingers: [open]).

2 differences within ***place***: 🤌FOURTEEN_1 (selected fingers: [0], orientation: [radial]) and 🤌FOURTEEN_2 (selected fingers: [one], orientation: [palm]), different location follows from the orientation of hand 2 (hence phonetics).



TUNISIA



FOURTEEN

S&LM (2006) mention **[rep]**, but the exact definition and place in the H-T model remains uclear.

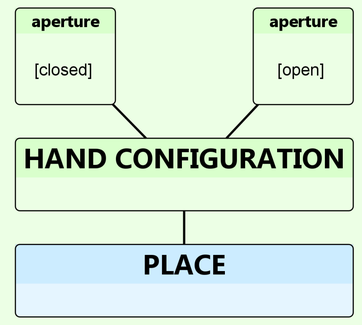
We apply [rep] in one vs. several movement-pairs (e.g., 🤌WHY_1 and 🤌WHY_2); on the basis of existing lexical mininal pairs (🤌MORNING and 🤌CLOTHES).

We do not apply [rep] in *n* vs. *n+1* movement-pairs (e.g., 🤌CHRISTMAS_1 vs. 🤌CHRISTMAS_2), because phonological status of such a contrast is unattested. We classsify the pairs as phonetic variants.

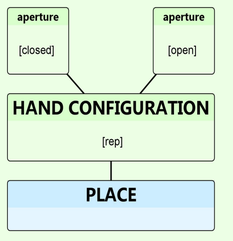
We place [rep] under all the categories: ***HC*** (position → aperture: 🤌SHOWER, orientation: 🤌NO), ***movement*** (🤌SEPTEMBER), and ***place*** 🤌FIT (together with [contact]).

In H-T model, **internal movement** belongs to ***HC***, unlike Brentari's (1998) Prosodic model, which unifies path and internal movement into a single category.

There are two types of internal movement: i) opening/closing of the hand (e.g., 🤌LAMP) and ii) orientation change (e.g., 🤌TRANSLATE), which we analyze as branching of the aperture or orientation features, respectively.



Secondary movement is defined as quick repeating change of position or orientation of the hand, and finger wiggle (S&LM 2006: 197); the representation in the model is not explicitly given in S&LM (2006). We decompose secondary movement into [rep] and ***HC*** subcategories: position → aperture (e.g., 🤌SHOWER) and orientation (e.g., 🤌NO); or place [wiggle] at selected fingers (e.g., 🤌ISRAEL).



Mouthing and mouth gestures ussually bear a lexical difference e.g., 🤌DINNER and 🤌BREAKFAST (signs that contain the manual part for 🤌EAT and differ by the mouthing of Czech words for *dinner* and *breakfast*).

To find a phonological role is rare; e.g., different mouth gestures in 🤌RUDE_1 and 🤌RUDE_2.

Mouthing exhibits idiolectic variation, typically in the number of syllables of the corresponding spoken equivalent, which is being silently articulated.

Since the phonological status of mouthing and mouth gestures is not clear, these categories are not included in the H-T model and our analysis at the moment.

3. Discussion

Criterion for variant/synonym distinction: equivalent meaning and minimal formal difference. **One parameter changes → variants; two and more parameters change → synonyms.** As parameters we understand handshape, place and movement (Fenlon et al. 2015 consider also orientation while classifying the variants but in H-T model, orientation is a subcategory of hand configuration).

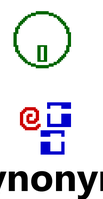
COFFEE_1 — **compared item**

COFFEE_2 — place (location: different L2) — **variant**

COFFEE_3 — place (location: no L2; [rep]) — **variant**

COFFEE_4 — place (location: different L2), movement — **synonym**

COFFEE_5 — place, handshape, movement — **synonym**



Work in progress: 300 phonologically related pairs: 258 variant-pairs (🤌COFFEE_2 and 🤌COFFEE_3), 42 synonym-pairs (🤌COFFEE_4 and 🤌COFFEE_5). **Aims**: i) classification of the complete language sample in *Dictio;* ii) typology of variation in Czech SL (statistics for parameters and categories).

All video examples from *Dictio*. ✤ BRENTARI, Diane, 1998. *A prosodic model of sign language phonology.* MIT Press. ✤ *Dictio: Multilingual Online Dictionary* [online], Masaryk University, Brno [cit. 2020-01-27]. Available at: www.dictio.info ✤ FENLON, Jordan, Kearsy CORMIER and Adam SCHEMBRI, 2015. Building BSL SignBank: The lemma dilemma revisited. *International Journal of Lexicography*. 28(2), 169–206. ✤ LIDDELL, Scott and JOHNSON, Robert, 1989. American Sign Language: The Phonological Base. *Sign Language Studies*. 64(1), 195–277. ✤ SANDLER, Wendy, 1995. Markedness in the handshapes of signs: a componential analysis. VAN DER WEIJER, Jeroen and Harry VAN DER HULST. *Leiden in Last: Holland Institute of Linguistics Phonology Papers*. The Hague: Holland Academie Graphics, 369–399. ✤ SANDLER, Wendy and Diane LILLO-MARTIN, 2006. *Sign Language and Linguistic Universals*. New York: Cambridge University Press.

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