
How sign learners' errors may inform phonetic variation in gesture

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Gesture and sign are subject to the same affordances and physical restrictions of the manual modality, yet still differ in significant ways. Where sign is the primary mode of meaning-conveyance, gesture primarily occurs in support of or as supplement to speech (McNeill 2020). This may be a reason that sign adheres to stricter rules and allows for less – but still some – formational variation. Sign languages have defined phonological inventories, commonly divided into the main parameters handshape, location and movement. Each parameter can be described in further detail in features, such as the selected fingers (e.g. B vs. T) or spread of fingers (e.g. T vs. Y). Most of these features, however, allow for some phonetic variation without affecting meaning (Crasborn 2001). The range of possible variation in sign may also provide pointers for the study of gestural phonetic variation, since what may vary in sign, is unlikely to be restricted in gesture.

Here, we explore the range of variation of sign features through both production errors and their effect on comprehension. In two studies we inventoried the errors produced by hearing learners of DGS (German Sign Language; N=17) in a lexical repetition task and presented the most frequent errors to native DGS signers (N=42) in an EEG study. Phonetic feature-level annotations of the learner productions revealed which features are more or less likely to result in a production error. The two or three most difficult features per parameter were manipulated in the stimuli of our EEG study. We presented native signers with studio recordings of the errors (n=90), as well as the same signs without error (n=90). The unexpected form in signs with errors were predicted to elicit an N400 effect; repair mechanisms reflected in a Late Positivity were expected to be modulated by degree of variation.

Features in each of the parameters were represented in the learner errors, more often in handshape and movement than location. Compared to previous studies (e.g. Ortega & Morgan 2015), we found a relatively high number of errors in the parameter location, likely due to our phonetic (not phonological) approach. Furthermore, ERP results show that these deviations in location elicit a weaker mismatch effect (negativity) than handshape errors and no repair (late positivity), supporting the notion that minor location variation is indeed more likely phonetic than phonological (Crasborn 2001). Extending this to gesture would suggest that minor variations in location will be less likely to have consequences for meaning constitution than variation in handshape or movement.

References: • Crasborn, O.A. (2001). *Phonetic implementation of phonological categories in Sign Language of the Netherlands*. Doctoral diss. • McNeill, D. (2000). *Language and Gesture*. Cambridge Univ. Press. • Ortega, G. & G. Morgan (2015). Phonological Development in Hearing Learners of a Sign Language. *Language Learning* 65(3). 660–688.