

## Is 4 the same as 4? Number signs and finger gestures in bimodal-bilingual settings

Counting, Finger Gestures, German Sign Language, Montring, Number Signs

Using the fingers to represent numbers is a natural tool in humans. Depending on the number concept, finger gestures can be used for counting or montring [1]. Finger counting focuses on the ordinal aspect of numbers in the way that fingers are used for counting sequentially [1,2]. Montring focuses on the cardinal aspect of numbers as in showing the cardinality of the set of objects [1,3,4]. Specific finger patterns can be observed for both counting and montring [1,3]. These patterns are culturally-dependent [5]. German-speakers' finger gestures in counting display an overall high degree of uniformity with a specific finger pattern (see Fig. 1a). Numbers higher than five are presented by extending the fingers of the second hand (transition) [4,6]. German Sign Language (DGS) exhibits a two-handed main-base-10 with a sub-base-5 structure number system [7]. Conventional number signs are produced by specific numeral handshapes [8] (see Fig. 1b). Signer's usually start with their dominant hand and in numbers higher than five, fingers are extended on the dominant hand instead of transitioning to the non-dominant hand.

Research on finger gestures and cultural contact suggests that in hearing bilingual speakers, not only are both languages active at the same time [9] but also both gestural systems, resulting in a "loosening of conventions" [4, p. 78]. Due to the visual-gestural modality of DGS, the question arises how DGS number signs and finger gestures interact in deaf bimodal bilinguals. In the present study, we investigate i) the numeral handshapes of lexical number signs, finger counting, and finger montring and ii) whether these handshapes differ from the finger gesture system of the cultural majority.

We conducted semi-structured interviews with six deaf L1-signers of DGS with different tasks that elicited number concepts. We annotated each number sign for numeral handshape, starting hand and transition. Results show that numeral handshapes for montring and lexical number signs strongly resemble each other. However, they differ from numeral handshapes for counting especially for numbers 4 and 9. In addition, the interviews showed, that number representations are dependent on the particular language setting: when counting objects or montring numbers in a non-DGS setting with hearing non-signers, L1-signers switch to the gestural system of German speakers. Our data confirms that deaf L1-signers use DGS language-specific finger patterns for lexical number signs and montring. However, as described for hearing bilinguals, they adapt their communication mode in relation to their conversation partner.

### Figures



Figure 1a: Finger gesture pattern of German speakers in spontaneous counting

Figure 1b: Numeral handshapes of lexical number signs of DGS

## References

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