The head for thinking, the eyes for seeing? Investigating the relationship between place of articulation (PoA) and two semantic domains in German Sign Language (DGS).

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All sign languages share that they employ many signs where the relationship between the form of a sign and its meaning is being represented iconically. We can find iconicity in sign languages on all linguistic levels (Perniss et al., 2010). On the phonological level, iconicity can be present in all parameters, such as the place of articulation (PoA; Börstell & Östling, 2017; Zeshan & Palfreyman, 2019). The PoA can be associated with a certain meaning, e.g., the PoA (fore-)head is often associated with signs addressing cognitive aspects (Börstell & Östling, 2017; Kimmelman et al., 2017; Östling et al., 2018; Rosenstock, 2006; Wilcox, 2005; Zeshan & Palfreyman, 2019). Some of these studies consider DGS in their data set (Östling et al., 2018; Rosenstock, 2006), but none of them shows the quantitative relationship between a semantic domain and the associated PoA for DGS. Therefore, this work is a contribution to the theoretical understanding of the iconic form-meaning relationship between the two semantic domains *cognition* and *visual perception* and the PoAs of the respective signs in DGS.

To investigate this relationship, we gathered German action/process words and composed two lexeme lists for the two semantic domains. These lexemes were taken from different resources, such as data of previous research on this topic as well as Concepticon (List et al., 2022; List et al., 2016). As this yielded only few lexemes in the semantic domain *visual perception*, a third resource was added (Dornseiff, 2020) to obtain a similarly long list as the one for the semantic domain *cognition*. In a last step, all lexemes were double-checked through GermaNet (Hamp & Feldweg, 1997; Henrich & Hinrichs, 2010) to assure a uniform classification. The list for the semantic domain *cognition* consists of 45 lexemes, the one for *visual perception* of 55 lexemes. These lexemes were then searched for in iLex, the database of the DGS-Korpus project (Hanke & Storz, 2008; Hanke, 2002). A sign was labelled a match if one of its proposed meanings in the database was the same as the German lexeme from our list. With this defined procedure, it was not always possible to find a respective sign for each German lexeme, for example when searching for multi-word-expressions. Yet, as a meaning can be expressed by various signs and a sign can have different variants, this may result in more signs than the original German lexemes. For the semantic domain *cognition*, we found 90 matches and for the semantic domain *visual perception*, we found 40 matches. Signs were categorized regarding their PoAs following a combination of the annotation conventions from the DGS-Korpus project (Konrad et al., 2022) and Kimmelman et al. (2018).

Results show that 42% of the signs in the semantic domain *cognition* are articulated near the forehead. The next frequent PoA is the neutral signing space with 23% of the signs (see Figure 1). Taking all PoAs with forehead and head together, 57% of the signs are articulated near the (fore-)head. Thus, consistent with previous research for other sign languages, in DGS as well, the (fore-)head as a PoA is strongly related to the semantic domain *cognition*. However, the expected relationship between the semantic domain *visual perception* and the PoA eyes seems not to be as strong as the one between *cognition* and (fore-)head: Only 20% of the signs are articulated near the eyes. The same number of signs are articulated in the neutral signing space (see Figure 2). Potential explanations for these numbers are the relatively small set of signs investigated, the need to not block the eyes with the hands as the primary channel of input, and restrictions in the predefined annotation schemes for PoA. However, grouping the physically close PoAs eyes, nose and cheeks into the category *upperface* clearly shows the expected tendency for signs in the semantic domain *visual perception* to be articulated around the eyes (see Figure 3).

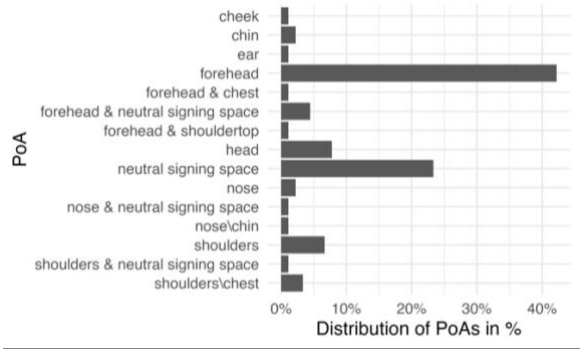

Figure 1: Relative frequency of PoA of signs in the semantic domain *cognition* (n=90).

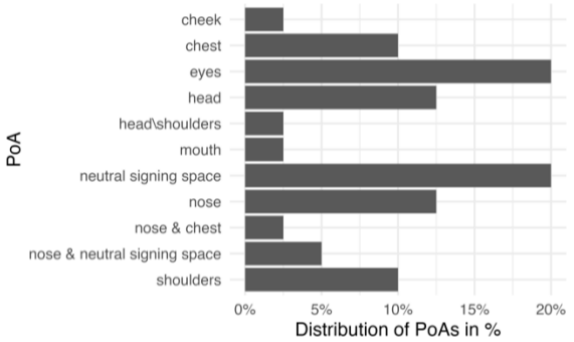

Figure 2: Relative frequency of PoA of signs in the semantic domain *visual perception* (n=40).

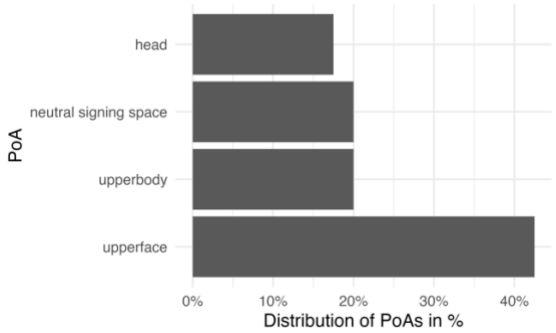

Figure 3: Relative frequency of PoA of signs in the semantic domain *visual perception*, grouped (n=40).

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