Seeing signs of morphology: form-meaning relations in British Sign Language morphology is iconic for hearing non-signers

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Iconicity is a core property of spoken and signed languages (Perniss et al., 2010), and taps into shared human cognition. Evidence comes from sign languages: the meanings of some iconic signs can be guessed without prior linguistic knowledge (Ortega et al. 2019), although this is not always the case (e.g., Sevcikova Sehyr & Emmorey 2019), and it has been shown that language knowledge considerably affects the perception of iconicity (Occhino et al. 2017). Iconicity drives the emergence of phonology and the lexicon in emerging sign languages (Sandler et al. 2011); moreover, many sign languages show great cross-linguistic similarities in their lexicons due to overlap in iconic motivations and mappings (e.g. Currie et al. 2002) and recruit articulatory properties for iconic purposes (e.g. Börstell et al. 2016 for articulatory plurality). Nevertheless, the bulk of studies on the pervasiveness of iconicity in sign languages focus on the lexicon with anecdotal mentions that sign language morphology is also shaped by iconicity as evidenced by considerable cross-linguistic similarities (e.g. Aronoff et al. 2005). Initial evidence suggests that one morphological aspect, namely derivational movement modification between nouns and verbs in American Sign Language, is not caused by cognitive biases but by language-internal factors (Pyers & Emmorey 2022). In our study, we follow up on this study by testing the sensitivity to the iconicity in several different morphological modifications of British Sign Language (BSL), aiming to contribute further evidence whether iconicity in sign language morphology arises due to shared aspects of human cognition.

We tackle this by testing hearing non-signers on whether they correctly identify the meaning of morphological modifications in BSL, using a forced-

choice guessing task on Prolific. We presented participants with pairs of signed stimuli: a citation form and a form with morphological modification. Morphological modifications included verb directionality (modification of movement path), verbal plural (sweep vs. repeated movement), aspect marking (fast vs. slow movement), and non-manual modification (puffed cheeks vs. tongue protrusion). We recruited 100 hearing British participants without any sign language knowledge through Prolific (Female: 50; mean age: 40 years). Participants were presented with the citation form video accompanied by a single lexical equivalent in English and then asked to pick one of four possible English translations to match the sign with a morphological modification.

Combining descriptive and inferential statistics, our data suggests that BSL morphology is iconic even without language knowledge (Figure 1); the accuracy of hearing non-signers in picking the correct response is significantly better than chance ($p < 0.001$ in an intercept model with random intercepts for participant and item). To further explore this effect within each morphological modification, we conducted four exploratory analyses on each subset of the data: except for verb directionality, response accuracy is significantly predicted by morphological modification (mixed effects modeling with random intercepts for item and random slopes for participant).

Together, these findings suggest that iconicity in sign language morphology is accessible without sign language knowledge due to shared human cognition. Showing that hearing non-signers can access iconicity in morphological structures similar to how they are able to use it on the lexical level emphasizes the resilience of iconicity in sign languages and highlights the importance of the core property of iconicity in language emergence and evolution.

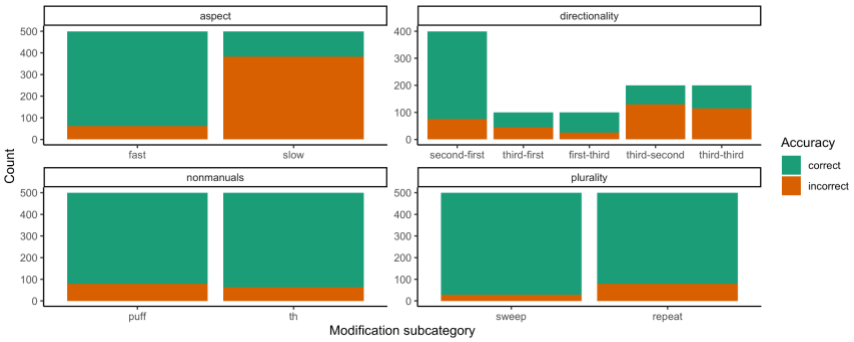

Figure 1: Overview of results.

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