



Body Anchoring and Iconic Anchoring: Biomechanical and Semantic Motivation of Signs in Non-Neutral Signing Space

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Background

- Articulatory effort influences linguistic forms (Napoli et al. 2014, Ann 2006).

In sign languages:

- Undershoot (Mauk 2003)
- Weak Drop (Padden & Perlmutter 1987, van der Kooij et al. 2001)
- Historical lowering (Frishberg 1975), etc.
- Signs higher in the signing space require more articulatory effort than in the neutral space.
- Yet many signs are produced in the non-neutral signing space. Why is that?
- We consider two possible non-competing explanations: body-anchoring and iconic anchoring.

Body anchoring

Signs specified for location with a body contact are **body-anchored**:

- Body-anchored signs are **biomechanical endpoints**: a type of biomechanical quantal region (Moisik & Gick 2017).
 - Easy articulatory targets
 - Robust to muscle activation overshoot
- As such, they are resistant to:
 - coarticulation (Russell et al. 2011; Mauk et al., 2008; Ormel et al., 2012);
 - historical change, e.g., lowering (Frishberg 1975);
 - L1A errors (Marentette & Mayberry 2000)

Iconic anchoring

- We propose an additional type of anchoring, which we call “iconic anchoring.”
- We suggest that signs specified for *location* because these locations contribute to the signs’ meaning are **iconically anchored**:



ASL sign EAT is iconically anchored to its location (mouth), as this is where eating happens

- Some body locations are more prominent than others, in certain semantic domains (Börstell & Östling 2017; Östling et al. 2018).

Note: These two types of anchoring are NOT mutually exclusive: signs can be **double-anchored**, i.e., both body- and iconically anchored.

Research question

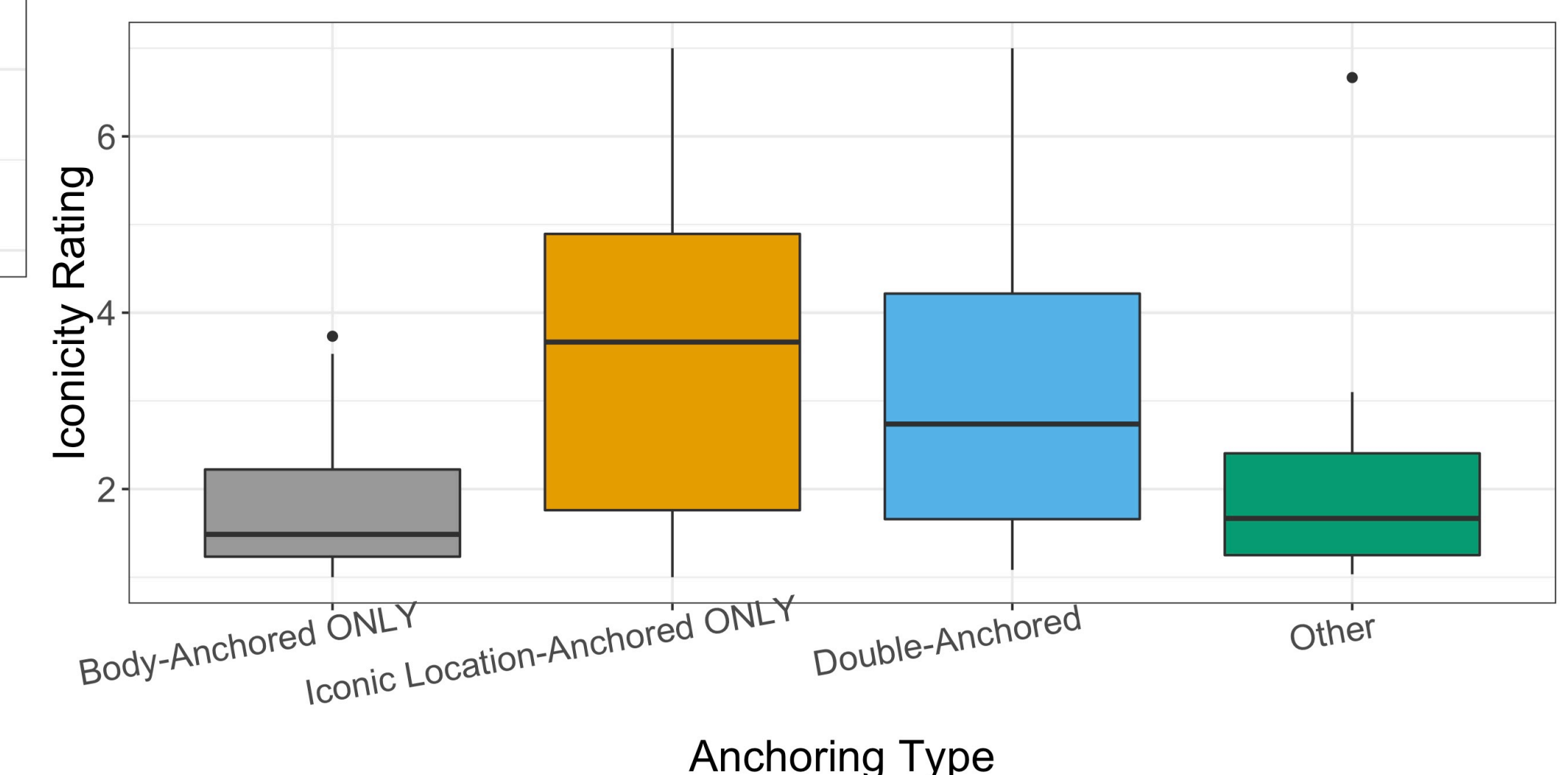
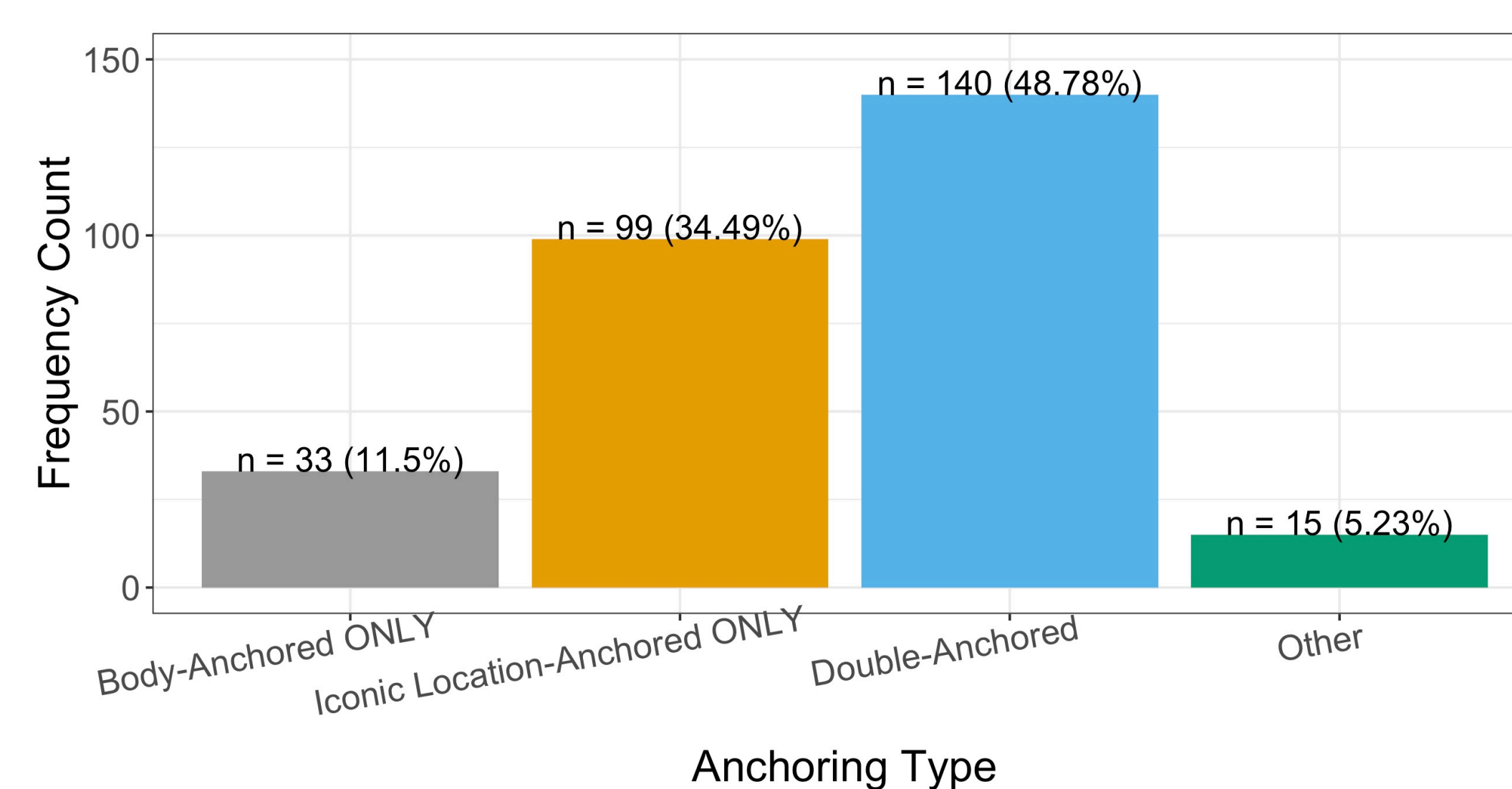
- To what extent can body- and iconic-anchoring account for the existence of signs not in the neutral space?

Methods

- Data from ASL-Lex (Caselli et al., 2017); included n = 691 signs
- Exclusion criteria: clipped videos, compounds, “unusual” values for their primary parameters
- ASL-Lex includes iconicity ranking (1-7)
- We added:
 - body-contact coding
 - iconicity coding for location, handshape, & movement (binary)
 - checked with the historical and etymological dictionary of ASL (Shaw & Delaporte 2014), whenever possible

Results

- 45% of signs (287/691) produced in non-neutral signing space
- Of these 287 signs, 173 (60%) are body-anchored and 239 (83%) iconically anchored:



- Iconically anchored signs have the highest overall iconicity, suggesting that body-anchoring might compensate for a lack of iconicity in double-anchored signs:
 - body vs. iconic: $t(116.62) = 7.6, p = 8.37e-12$ (* Sig)
 - body vs. double: $t(106.63) = 6.36, p = 5.18e-09$ (* Sig)
 - iconic vs. double: $t(207.69) = 1.89, p = 0.06$ (* NS)

Discussion

- While there may be a perceptual motivation as well, body- and iconic-anchoring can account for the majority of signs produced in the non-neutral signing space.
- Iconic anchoring in isolation is in fact more common than body anchoring in isolation, but the two also tend to co-occur.
- When they co-occur, the existence of body-anchoring may allow for a decrease in overall iconicity.

Future directions

- Replicate the study with a larger dataset and on other sign languages.
- Are there other articulatory differences between body- and iconically anchored signs beyond a body contact?
- Are body- and double-anchored signs more resistant to change than iconically anchored signs? Or can other forms of reduction be employed? (e.g., ASL HORSE became one-handed even though horses have two ears).



ASL: HORSE

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