Motivation in Two-Handed Signs: A Cross-Linguistic Investigation of Word Forms

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Introduction

Two-handed signs are subject to formal constraints[1] and can change over time[2] or under certain phonological and morphological conditions[3].

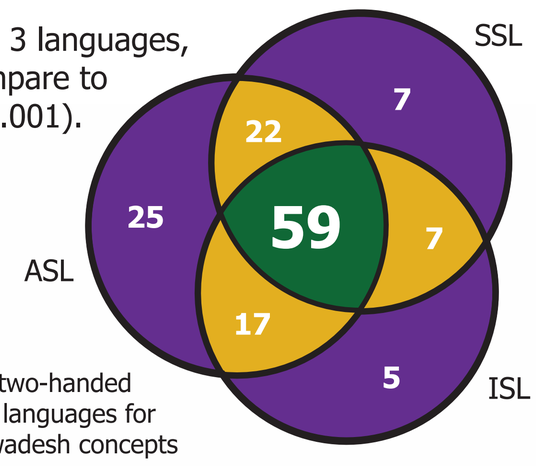
Is the underlying division between one- and two-handed signs totally arbitrary?

Part 1: Two-Handedness is Not Due to Chance

For 200 concepts in 3 languages: Is the sign two-handed or one-handed?

59 concepts are expressed using two-handed signs in all 3 languages, even though the exact forms are often not identical. Compare to **25** expected to overlap due to chance (binomial test, $p<.001$).

Ex. **SIGN** is two-handed in all three languages. **COLOR** is two-handed in ISL and SSL only, and **TRICK** is two-handed in ASL only.



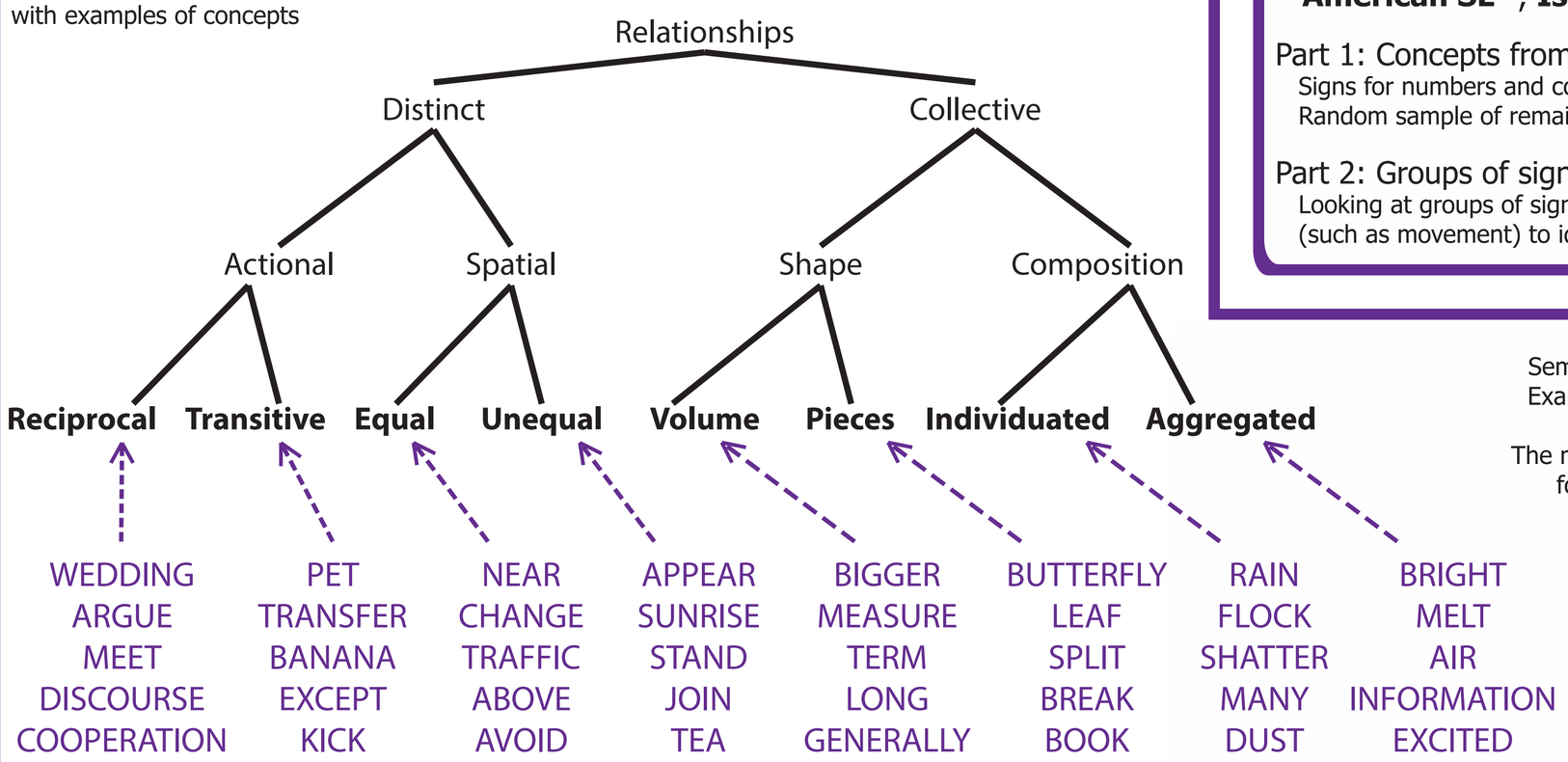
Distribution of two-handed signs among 3 languages for a list of 200 Swadesh concepts

Main Questions

1) How can meaning predict whether a sign will be two-handed?
2) What meanings recur among two-handed signs, across languages?

Part 2: Two-Handed Signs Encode Relationship Types

Semantic features mapped to two-handed signs across languages, with examples of concepts



Example mapping: In the ASL sign MEET, the two hands each represent how distinct entities act in a **reciprocal** relationship.

Semantic **features** are listed in **bold**. Example concepts are listed in purple.

The more salient a semantic **feature** is for a given concept, the more likely that sign is to be two-handed.

However, we hypothesize that languages can vary as to which **features** are relevant to encode a concept...

and we suggest that the semantic **features** themselves are what recur among two-handed signs across languages.

It is not simply concepts, but salient sensory images and semantic features associated with concepts, that foster two-handed signs.

Data and Methodology

Three dictionaries and Deaf native consultants:
American SL[4], **Israeli SL**[5], & **Swedish SL**[6]

Part 1: Concepts from ECHO Swadesh list[7]
Signs for numbers and country names removed
Random sample of remaining signs selected for testing

Part 2: Groups of signs from each language
Looking at groups of signs with shared phonological features (such as movement) to identify recurring semantic mappings

Discussion and Conclusions

Looking at groups of two-handed signs, we identified recurring mappings:

The two hands are frequently used to show:
- Participants in an event
- Spatial configurations
- Physical dimensions
- Internal composition

Certain meanings drive two-handedness

Meaning is not deterministic, however:
- two fingers instead of two hands
- the body instead of a flat hand
- languages can vary arbitrarily

Meaning is ONE of the factors that can influence whether a sign will be two-handed

Predictions about tendencies can only be validated via cross-linguistic comparison[8]

Consistent with a growing body of research:

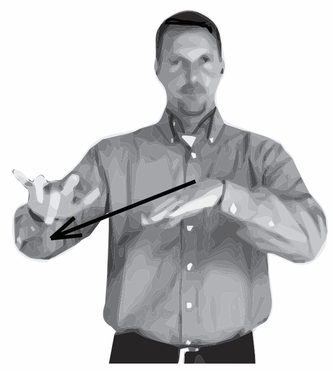
The sign modality shows how a lexicon arises on the basis of **iconicity**, and moreover how semantics are codified in linguistic structure[9,10,11]

Therefore, it is important to look at **patterns of iconicity** within and across languages, rather than only in individual forms[12,13]

EMPTY looks different in ISL, SSL, and ASL, but each language uses two hands: one to represent a surface or container, and the other to highlight that it is bare

ISL EMPTY

SSL EMPTY[6]



ASL EMPTY[14]

The arrangement and interaction of the hands encodes the asymmetrical spatial relationship

Future Directions

Currently testing hypotheses in a new village sign language, Al-Sayyid Bedouin SL[10]

Extending our dataset to include non-Western, non-urban sign languages, for a more complete picture and to further refine our hypotheses

Extending our hypotheses by looking at the relationship between classifiers and lexical signs, as well as patterns for one-handed lexical signs

Appendix: More on Semantic Features

We chose to uniquely label the terminal nodes in our tree, but these nodes could be replaced with sets of binary features:

We are currently evaluating the relative benefits/drawbacks of these two notational systems.

See handout for additional information about the definitions and criteria used for semantic features

Reciprocal: [+distinct, −spatial, +symmetrical]
Transitive: [+distinct, −spatial, −symmetrical]
Equal: [+distinct, +spatial, +symmetrical]
Unequal: [+distinct, +spatial, −symmetrical]
Volume: [−distinct, +shape, −separate]
Pieces: [−distinct, +shape, +separate]
Individuated: [−distinct, −shape, +separate]
Aggregated: [−distinct, −shape, −separate]

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