Typology in sign languages: can it be predictive?

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Examples of predictability of typological categories in Spoken Languages (Greenberg 1966)

If ‘x’ then ‘y’

1) If there are any gender distinctions in the plural of the pronoun, there are some gender distinctions in the singular also.

2) If a language has discontinuous affixes, it always has either prefixing or suffixing or both.

3) Languages with dominant VSO order are predominantly prepositional.
Previous work on SL Typology

• Brentari (1995) showed that signed languages (SLs) occupy a niche with respect to word shape
• Zeshan (2006) worked on Interrogative and negative constructions in a large number of SLs
• Padden, et al. (2009, 2013) worked on handshapes
predictive SL typology

- Quer (2012) followed up Zeshan’s work on negation with a syntactic analysis trying to predict variation in NMM spreading behavior based on typological membership.

- Today’s research report follows up on Padden’s work trying to predict morphological behavior of handshape based on typological membership.
predictive SL typology

• Quer (2012) followed up Zeshan’s work on negation with a syntactic analysis trying to predict variation in NMM spreading behavior based on typological membership.

• Today’s research report follows up on Padden’s work trying to predict morphological behavior of handshape based on typological membership.
Goals of today’ talk

1) Describe background on sign language iconicity and structure to show how the two interact in grammar in phonology and morphology.

2) present an experimental study of 4 SLs to determine the predictive power of typology for handshape type.

3) Argue that some cross-linguistic variation in sign languages can be explained by a type of iconic typology, in conjunction with an understanding of the language’s individual sensitivity to argument structure, particularly “instruments”.

Goals

1) Describe background on sign language iconicity and structure to show how the two interact in grammar in phonology and morphology.

2) Focus in on an experimental study of 4 sign languages and the predictive power of typology.

3) Argue that some cross-linguistic variation in sign languages can be explained by a type of iconic typology, and understanding of the language’s individual sensitivity to argument structure.
Iconicity: the 800-lb gorilla in the room

The manual sign . . . can and does derive great expressive force, directness, and unambiguousness from representing what it stands for through indication of its shape or movement, outline, or any other typical visual characteristic. This is at least how signs usually are born . . . and no matter how much they mature into arbitrary and conventional signs thereafter, they retain a dormant relation to this force that can be reawakened at any time . . . Iconicity is not a more or less accidental feature because it comes to the surface once in a while, but a basically concomitant characteristic that is potentially present all the time. (Tervoort 1973)
The assumption of the arbitrary nature of linguistic sign
The assumption of the arbitrary nature of linguistic sign
Iconicity & related constraints

- across core vs. spatial vocabulary
  - in handshape
  - in movement

* 3 fingers in the spatial lexicon
  (Eccarius, 2008)

* two planes in the core
  (Wallin, 1994)
Two types of iconic handshapes and their cross-linguistic properties of in morphosyntax

Handling handshapes
hand-as-hand
iconicity
H-HSs

Object handshapes
hand-as-object
iconicity
O-HSs
Handshape & Movement iconicity in the core & spatial lexicon

NATIVE LEXICON

core lexicon

Spatial lexicon
How do we know a property is phonological or morphological?

- **PHONOLOGICAL**
  - minimal pairs
  - use in a phonological process
  - if you change a particular property will it become unrecognizable as a legitimate form?

- **MORPHOLOGICAL**
  - Discrete: Can all the relevant forms be listed
  - Does the form generalize to new cases in a stable way?

- **ICONIC/MEANINGFUL ≠ MORPHOLOGICAL**
tape (noun)  tape (verb)
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Goals

1) Describe background on sign language iconicity and structure to show how the two interact in grammar in phonology and morphology.

2) Focus in on an experimental study of 4 sign languages and the predictive power of SL typology.

3) Argue that some cross-linguistic variation in sign languages can be explained by a type of iconic typology, and understanding of the language’s individual sensitivity to argument structure.
Typological study

• 4 Sign languages; 10 adult signers each:
  – American (ASL), British (BSL), Italian SL (LIS), Hong Kong SL (HSKL)
  – 9081 data points

• Grammatical topics addressed:
  – **Nouns, Verbs**
    • Are handling HSs or Object HSs preferred?
  – **Noun/verb distinction**:
    • HandlingHS *verb*; ObjectHS *noun*
  – **Agentive/non-agentive distinction**: Does knowing the handshape predict the type of clause:
    • HandlingHS *agentive*; ObjectHS *non-agentive*
H-HSs & O-HSs can express noun vs. verb: ASL

BOOK (noun)  TAPE (noun)  LOLLIPPOP (noun)

OPEN-BOOK (verb)  STRETCH/APPLY-TAPE (verb)  EAT-LOLLIPPOP (noun)
H-HSs & O-HSs can express Agentive-Non-Agentive opposition
Benedicto & Brentari 2004
Examples of predictability of typological categories in Spoken Languages (Greenberg 1966)

If ‘x’ then ‘y’

1) If there are any gender distinctions in the plural of the pronoun, there are some gender distinctions in the singular also.

2) If a language has discontinuous affixes, it always has either prefixing or suffixing or both.

3) Languages with dominant VSO order are predominantly prepositional.
Can we predict how a language will behave if we know only a some of the facts?

• Do these H-HSs and O-HSs show variability in equal measure across sign languages?
  – in nouns
  – in activity verbs in the core (put-on-lipstick)
  – in spatial predicates (move-book)

• Can we predict how a language will behave if we know only a some of the facts?
Iconic handshape preferences (Arnoff et al. 2009)
from Padden (2013)
hypothesis (1\textsuperscript{st} pass)

• If typological classes based on iconic preferences for handshape type in nouns, they should predict patterns and generate differences, such as:

  1) marking a nouns vs. verbs distinction
  2) predict variability in the use of “object” vs “handling” handshapes to indicate agentivity in classifier predicates
Tasks: 1. noun task

Non-instruments
• book, cigar, coin, gloves hat, jacket, jeans, lipstick, lollipop, marble, plane, shoes, socks

Instruments
• broom, comb, fork, hair, dryer, hairbrush, hammer, knives, mascara (brush), mop, nail file, nail polish (brush), paint brush, pen, phone, rake, scissors, screwdriver, spoons, tape, toothbrush, tweezer, vacuum, string
Padden materials

- Scissors
- Toothbrush
- Handsaw
Tasks: 2. Lexical verb task

- A verb labeling task with 40 common activity verbs, which corresponded to the nouns just presented
Classifier task

• A classifier predicate task with:

  “stative”  

  “unaccusative”

  transitive-agentive
Nouns: ASL & BSL

**Handling Object**

ASL

BSL
BSL noun clip
handshape type ASL & BSL: nouns & verbs

ASL uses handshape contrastively to distinguish nouns from verbs, but BSL does not.
proximal (larger) and distal (smaller) movements in ASL & BSL

distal movements occur in NOUNS in both ASL and BSL
Handshape types in ASL & BSL: classifier predicates

Handshape corresponds with agentivity in both languages; and differences in the amount of variation
BSL has a greater number of HandlingHSs where ObjectHSs would be expected.
Interim summary

• based on nouns BSL is handling preference; ASL is object preference.

• This has an effect on the verb noun distinction:
  – ASL distinguishes nouns using Handshape type and movement
  – BSL depends on movement alone

• Variation within the handshape pattern to express agency
  – No-agent contexts there are more unexpected Handling handshapes in BSL
nouns: ASL, LIS, HKSL & BSL
lexical verbs: ASL, LIS, HKSL, & BSL
handshape type in
ASL, LIS, HKSL & BSL nouns & verbs
Handshape types in ASL, BSL, HKSL & LIS: classifier predicates

- Blue bars: agent HandlingHS
- Red bars: agent ObjectHS
- Orange bars: no agent ObjectHS
- Dark blue bars: no agent HandlingHS

The chart shows the frequency of various handshape types in different signing languages, with error bars indicating variability.
Use of “unexpected” handshapes: both HKSL and LIS have relatively strong interference in both directions.
LIS verbs with instruments
Goals

1) Describe background on sign language iconicity and structure to show how the two interact in grammar in phonology and morphology

2) Focus in on an experimental study of 4 sign languages and the predictive power of typology

3) Crucial Argument: some cross-linguistic variation in sign languages can be explained by a type of iconic typology, and understanding of the language’s individual sensitivity to argument structure.
Nominalizations

“Derived nouns that have argument structure inherit this in some form from their verbal source”

Argument: nouns are *not* the only source of SL variation

- The thematic role of the noun in the VP plays an important role in deciding which type of handshape will be used in nouns and verbs in 2 of the 4 target languages.
nouns & verbs revised

Non-instruments
• book, cigar, coin, gloves, hat, jacket, jeans, lollipop, marble, plane, shoes, socks, tv

Instruments
• broom, lipstick, comb, fork, hair, dryer, hairbrush, hammer, knives, mascara (brush), mop, nail file, nail polish (brush), paint brush, pen, phone, rake, scissors, screwdriver, spoons, tape, toothbrush, tweezer, vacuum, string
Step 1: VERBS

**agentive verb-DO**

**agentive verb-instrument**

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Handling handshapes

Object handshapes
Step 2: NOUNS

Handling handshapes
Object handshapes
Step 3: Spatial verbs (classifier constructions):
Use of “unexpected” handshape: both HKSL and LIS have relatively strong interference in both directions.

![Bar chart showing percentages for different sign languages and contexts.](image)
progression

1. sensitivity to instrument vs. non-instrument verbs?

   no
   BSL, ASL

   yes
   HKSL, LIS

2. iconic preference in nouns

   sensitivity to instruments modulates the iconic preference in nouns

H-HS: BSL       O-HS: ASL

H-HS: HKSL      O-HS: LIS

3. noun preference is seen in classifiers as H-HS in non-agentives

   transparent transfer of noun iconicity to classifiers

   noun preference is seen in classifiers as O-HS in agentives

   modulated noun forms also color the agentive/non-agentive opposition
Conclusion: iconic preferences & thematic roles of nouns create typological classes in SL

- ASL: ObjectHS preference
- BSL: HandlingHS preference
- LIS: Instrument sensitivity + ObjectHS preference
- HKSL: Instrument sensitivity + HandlingHS preference
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&

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