ESRC Deafness Cognition and Language Research Centre

When Meaning Permeates Form: Iconicity Effects in British Sign Language

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Words are Arbitrary

- Words are (mostly) arbitrary-- there is no link between the form of a word and it's meaning

/kat/

Words are Arbitrary

small **little** **tiny**

Meaning linked to arbitrary forms
Easy to distinguish

small **smell** **smull**

Meaning linked to non-random forms
Difficult to distinguish

- Arbitrariness allows for maximum discrimination between words allowing for larger lexica to develop (Monaghan & Christiansen 2006, Gasser 2004)

Signs are iconic

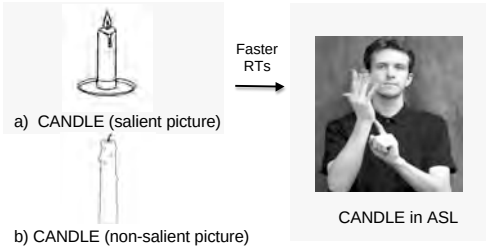
- *Iconicity* is the transparent relationship between meaning and form

- Sign Languages use iconicity much more than spoken languages
- If arbitrariness is so useful, why are so many words in signed languages iconic?

What are the consequences for language processing when mappings between meaning and form are iconic?

Picture-Sign Matching in ASL

Thompson, Vinson, Vigliocco, (2009) JEP:LMC



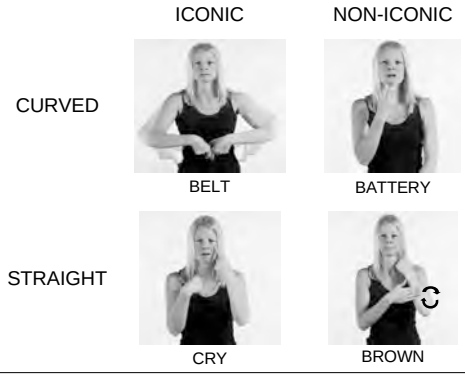
- Subjects faster to respond when iconic features of a sign are highlighted in a preceding picture
- Iconic links between sign and meaning DO affect processing

At which level(s) of representation does iconicity play a role?

Level of Meaning: iconicity affects only tasks where meaning is relevant

General Level: iconicity affects language processing everywhere (even when meaning is not relevant to the task)

Experiment 1: Handshape Decision Task



Method

Materials

162 video clips of BSL lexical signs normed for *iconicity, age of acquisition*, and *familiarity*
(Vinson, Cormier, Denmark, Schembri, Vigliocco, 2008)

Subjects

25 BSL signers
13 native signers
12 non-native signers (BSL after age 2)

Task

Does the sign have a straight/curved handshape?

Thompson, Vinson, Vigliocco, (2010) JEP:LMC

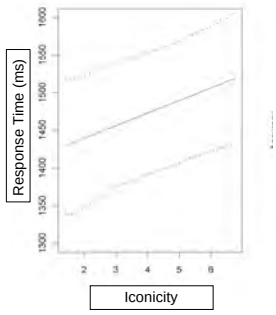
Analyses

- Mixed, crossed random effects models for both subjects and items
- Dependent measure:
  - Signer Response Times
- Predictors:
  - Non-signer Response Times* (n=15, perceptual factors)
  - Bent vs. Straight handshape
  - AoA
  - Familiarity
  - Group (native, non-native)
  - Iconicity

Taking other factors into account to what extent does iconicity predict performance?

Thompson, Vinson, Vigliocco, (2010) JEP:LMC

Results: Iconicity affects Response Times



*p=.01

Handshape decisions are significantly *slower* for iconic signs

Summary: Experiment One

- When signs are iconic, handshape judgments are more difficult as a result
- Iconicity effects are not due to specific (meaning-related) task

Hypothesis: Iconicity encoded in signs results in faster more automatic activation of meaning

Automatic access to meaning makes phonological decisions not related to that meaning more difficult

If correct: Automatic activation of meaning will speed phonological decisions directly related to that meaning

Experiment 2: Movement Decision Task

	ICONIC	NON-ICONIC
UP	 AEROPLANE	 NUT
DOWN	 CRY	 AFTERNOON

Method

Materials

- 108 video clips of BSL lexical signs normed for *iconicity* and *familiarity*
- 54 with a single upward motion/54 a single downward motion
- Balanced for iconicity, familiarity, concrete or abstract meaning, and noun or verb, big or small movement

Subjects

20 BSL signers

9 native signers

11 non-native signers (BSL after age 2)

Task

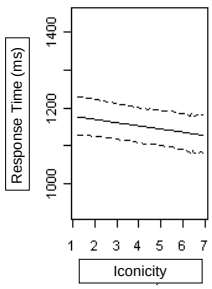
Does the sign have an upwards/downwards movement?

Analyses

- Mixed, crossed random effects models for both subjects and items
- Dependent measures:
  - Signers Response Times
- Predictors:
  - Non-signer Response Times (n=14, perceptual factors)
  - Upwards vs. downwards movement
  - Familiarity
  - Group (native, non-native)
  - Iconicity

Taking other factors into account to what extent does iconicity predict performance?

Movement Decision Results: Iconicity speeds Response Times



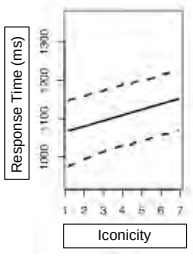
*p=.03

Up/Down phonological decisions related to meaning for *speeds* responses for iconic signs

Follow up: Experiment 2b Handshape Decision

Using the same items as in Experiment 2 will we see a repetition of slowed Response Times?

Experiment 2b: Handshape Decision Results Iconicity again slows Response Times



*p=.0002

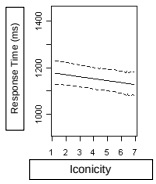
More iconic signs *again* slow decisions in handshape decision task

Summary: Experiment Two

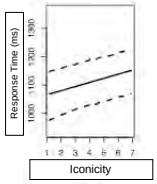
More automatic access to meaning makes:

- Decisions not related to the meaning more difficult/ slower
- Decisions related to the meaning easier/ faster

MV Decision



HS Decision

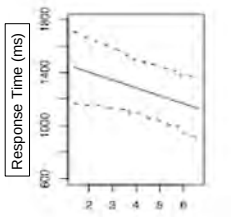


Can automatic activation of meaning speed straightforward lexical access?

Experiment 3: Picture Naming

421 Pictures
So far: **analyzed data for 102 signs**
With AoA, Familiarity, & Iconicity ratings
Subjects = 17

Experiment 3: Results Naming



p.=.015

General speed up effect for iconic signs when naming pictures

Conclusions

- Iconicity effects arise from automatic activation of meaning (even when meaning is not required)
- Iconicity affects language processing at all levels

Broad Conclusions

- Iconicity may be just as important as arbitrariness in using and learning language
- Arbitariness and Iconicity are *not* mutually exclusive and both may play an important role in processing
- Arbitariness may aid effective communication (by phonologically distinguishing similar meanings) while iconicity may provide links between language and the real world