

Sign language

Ling 001 – Fall 2016

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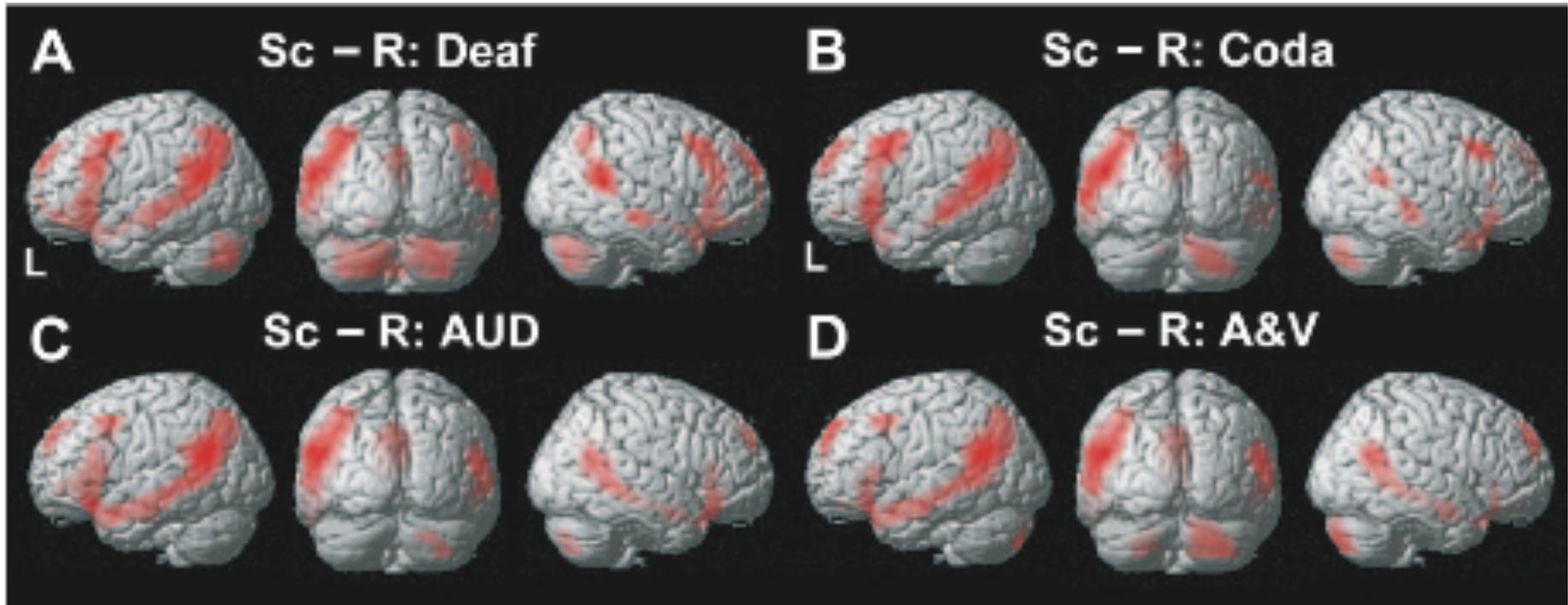
Some myths about sign languages

- Sign languages are not human languages.
- Sign languages are just pictures in the air.
- Sign language is universal.
- Sign languages are manual encodings of the surrounding spoken language.

Sign languages are languages

- Brain studies provide incontrovertible evidence that sign languages are human languages.
- Like spoken language, sign language is processed by the linguistic (generally left) hemisphere
- As with spoken language, trauma to the linguistic hemisphere results in either Broca's aphasia or Wernicke's aphasia.

Brain activation for sign and speech (fMRI study by Sakai et al. 2005:1411)



Arbitrariness vs. iconicity

- In spoken language, the form of a word (its sound) is generally unrelated to properties of its referent.
- Based on spoken language, arbitrariness has been taken to be a fundamental design feature of human language (Hockett 1960).
- Words in sign languages tend to be more iconic than are words in spoken languages.

TREE - American Sign Language



TREE - Chinese Sign Language



TREE - Danish Sign Language



Limits of iconicity - Synchronic, 1

- The three signs for TREE evoke the physical shape of the referent (= iconic).
- But the shape is evoked in different ways (= arbitrary), and the sign is fixed (= conventional) for each language.
- Signers cannot decide to use a different sign – no matter how iconic.
- Conventionality trumps iconicity.

Limits of iconicity - Synchronic, 2

- Etymologically iconic signs become opaque to native signers.
 - JOT < PUT + PAPER
- This is comparable to English compounds that have lost their transparency.
 - always < all + ways (cf. dialectal ‘all roads’)
 - cupboard < cup + board

Limits of iconicity - Diachronic

- The origin of signs is often iconic.
- But once a sign becomes conventional, the basis of the association with its referent becomes purely formal.
- Iconicity goes from being in the driver's seat to being a dispensable passenger.

Loss of iconicity

- As a result, a sign's iconic properties are subject to erosion.
 - HOME < EAT + BED
 - SISTER < GIRL + SAME
 - STUDENT < LEARN + agentive suffix

Universal sign language?

- Ethnologue lists 130 Deaf sign languages throughout the world

How do sign languages arise?

- Spontaneous emergence
 - Home sign
 - Village sign
- Some examples
 - Nicaraguan Sign Language
 - Al-Sayyid Bedouin Sign Language
 - Martha's Vineyard Sign Language
- Language movement, contact, and evolution
 - Comparable to the emergence of pidgins and creoles
 - ASL is one example of this

ASL is not fingerspelled English !

- Sign languages are not manual encodings of the surrounding spoken language.
- ASL is not historically related to English.
- It is not historically related to British Sign Language.
- It is also not mutually intelligible with BSL.

ASL < LSF

- ASL is historically related to L(angue des) S(ignes) F(rançaise) (French Sign Language).
- It developed in the early 1800s from contact between LSF and early North American village sign systems.
- Notable among the latter is Martha's Vineyard Sign Language (< Old Kentish Sign Language).

Sign language has phonology (!)

- *phon-* < Greek for voice
- How can languages that don't use the voice have phonology?

Duality of patterning, 1

- All human languages have meaningful units (morphemes) that combine with one another to yield phrases and sentences.
- The part of a language's grammar that governs the combination of meaningful units with one another is called the morphosyntax.

Duality of patterning, 2

- Individual morphemes can be broken down into meaningless units.
- The part of the grammar that governs the combination of the meaningless units among each other and into the meaningful units is called the phonology.

Duality of patterning, 3

- The bifurcation of grammar into syntax and phonology is a key design feature of human language.
- Hockett 1960 calls it duality of patterning.
- Duality of patterning is independent of a language's modality (signed or spoken).

Duality of patterning, 4

- Both spoken and signed languages have meaningless units.
- The meaningless units in spoken language concern gestures made with the muscles of the vocal tract, resulting in acoustic signals.
- The meaningless units in signed language concern gestures made with other muscles (notably the arms and hands, but including others), resulting in visual signals.

Phonological minimal pairs in English

- b-ad, d-ad, f-ad, m-ad, ...
- b-a-d, b-e-d, b-i-d, b-u-d, ...
- ba-d, ba-g, ba-ck, ba-n, ...
- The words in each of these groups are not related by way of meaning.
- Rather, they are related by way of form; their relation is purely phonological.

Phonological minimal pairs in ASL

- ASL has phonological minimal pairs that are comparable to the ones for spoken languages.
- The minimal pairs provide evidence for linguistic properties that are independent of meaning – that is, for phonology and duality of patterning.

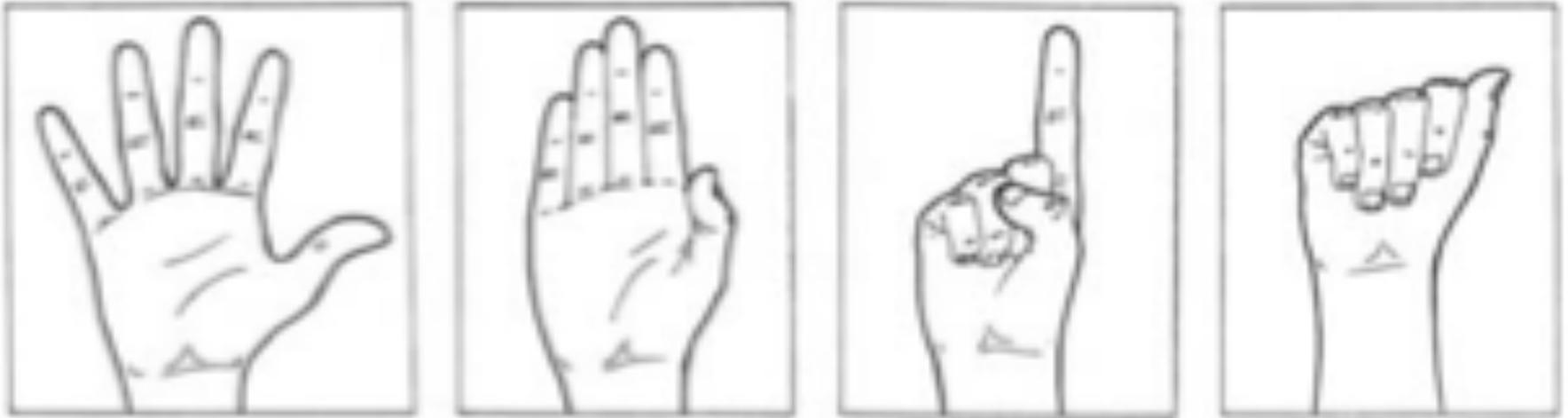
Phonological parameters of sign languages

- Handshape
- Location
- Movement
- Orientation
- Non-manual features

Handshape

- Position of fingers and thumbs and flexion / extension of relevant joints
- Minimal pairs show that handshape is part of a morpheme's lexical entry (i.e., it must be memorized).
- CANDY vs. APPLE

Unmarked handshapes, 1

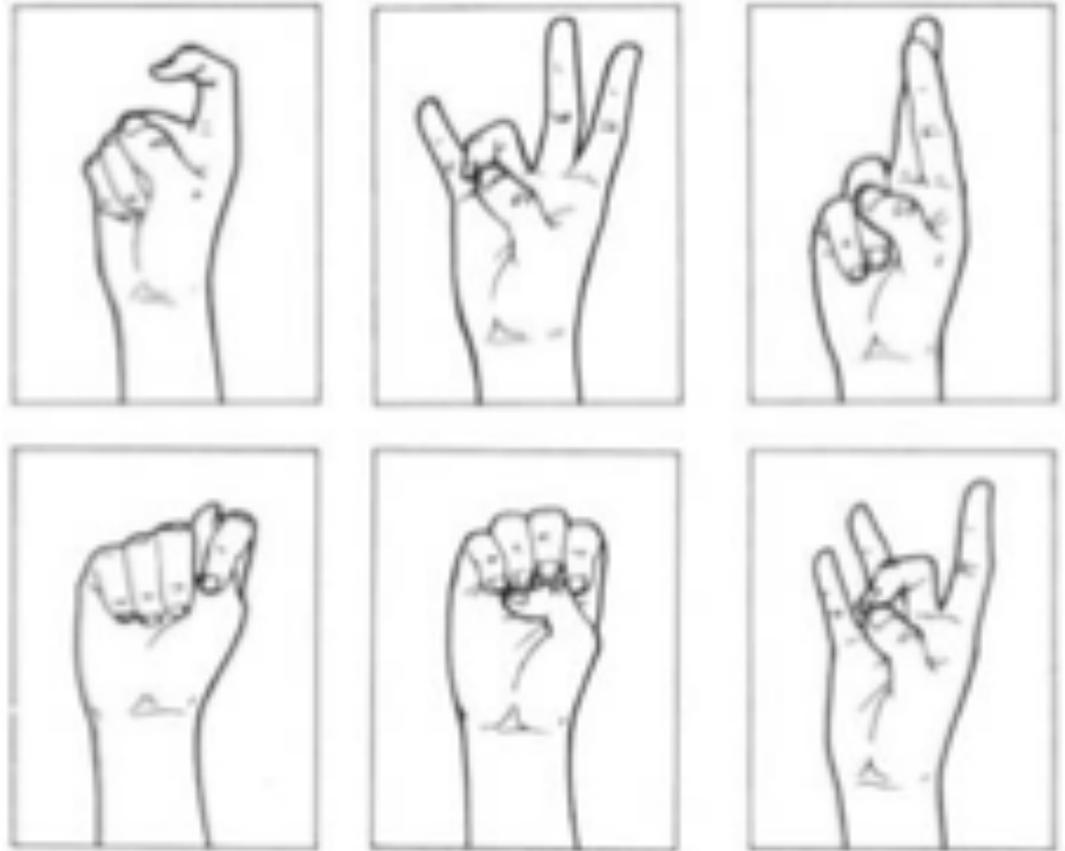


Unmarked handshapes, 2

- Perceptually most distinct and salient
- Universal across sign languages
- Used most frequently in each sign language
- Acquired earliest
- Phonologically less restricted

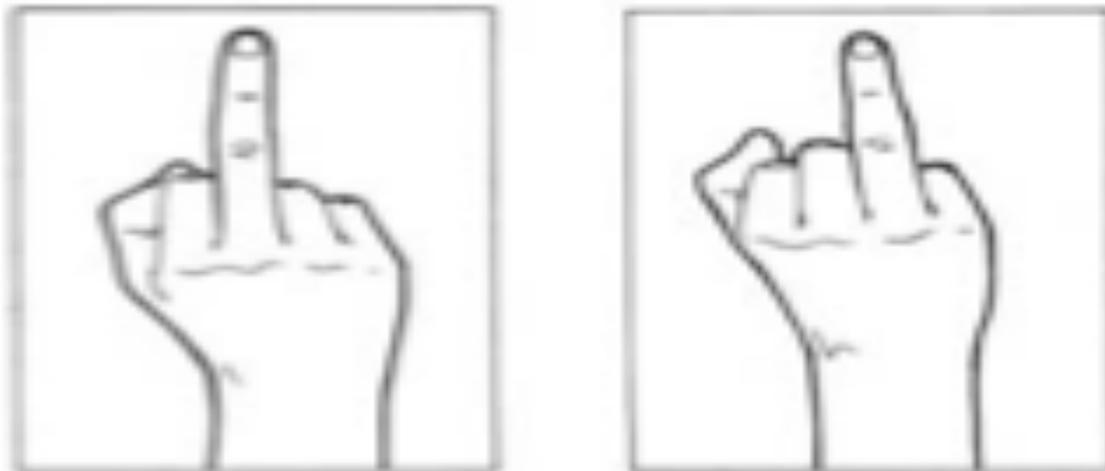
Marked handshapes

- 20+ in ASL
- Articulatorily and perceptually more complex
- Less common in and across sign languages
- Acquired later
- Phonologically more restricted



Handshape - Crosslinguistic variation

- Each sign language uses a limited number of possible handshapes.
- Handshapes may be grammatical in one sign language, but ungrammatical in another.
- Taiwan Sign Language signs for BROTHER and SISTER are ungrammatical handshapes in ASL.



Location

- Place of articulation relative to face, torso, or non-dominant hand or arm
- Again, minimal pairs show that location is part of a morpheme's lexical entry
- SUMMER vs. UGLY vs. DRY

Movement, 1

- Primary movements
 - Straight vs. arc vs. hook (“7”)
 - Vertical vs. horizontal
 - Towards vs. away from the body
 - Unidirectional vs. bidirectional
- Secondary movements
 - Wiggling or hooking fingers

Movement, 2

- CHAIR vs. TRAIN
- CHURCH vs. CHOCOLATE
- Also, deverbal nominalizations:
 - SIT, CHAIR

Orientation

- Various parts of the hand (palm, fingertips) can be oriented differently.
 - Up or down
 - In or out
 - Ipsilateral (right hand faces right) or contralateral (right hand faces left). Analogously for left hand.
- SOCK vs. STAR, GAME vs. WITH

Non-manuals, 1

- Non-manual gestures involve the head, eyebrows, mouth, position of body, etc.
- Independent of expression of affect !
- LATE vs. NOT-YET

Non-manuals, 2

- Gestures with whole head or lower face can indicate adverbial modification
 - Headshake ‘negation’
 - MM ‘as usual, with enjoyment’
 - TH ‘carelessly, sloppily’
 - Puff cheek = takes a long time

Non-manuals, 3

- Gestures involving eyebrows and angle of upper body are comparable to spoken-language intonation
 - Marks topics
 - Mark sentence type
 - Statement vs. yes-no question vs. wh-question
 - Distinguish true questions from question-answer pairs

A further source of evidence for sign phonology

- Deaf Broca's aphasics produce partial errors resulting in nonsense words.
- The sign on the right has the correct location and movement for FINE, but the wrong handshape.



Questions?

References

- Sakai, Kuniyoshi, Yoshinori Tatsuno, Kei Suzuki, Harumi Kimura, and Yasuhiro Ichida. 2005. Sign and speech: Amodal commonality in left hemisphere dominance for comprehension of sentences. *Brain* 128:1407-1417. Available online through Franklin.

Influences of surrounding language and culture

- Shared gestures

ME = point to nose in Japan, point to chest in most other parts of the world

- Fingerspelling

- Mouthing

- Morpheme order

25 generally twenty + five, but five + twenty in German Sign Language (cf. German *fünfundzwanzig*)

Types of signs (in the sense of Peirce)

- Icon

Sign resembles referent in some respect

- Index

Sign has some real-world connection to referent
(other than resemblance)

- Symbol

Sign has an arbitrary relation to referent

What about onomatopoeia?

- Onomatopoeia: acoustic iconicity
- Acoustic indexicality is exploited in naming brands.
- But onomatopoeia is not central to spoken languages.

Visual iconicity

- From a game-theoretic point of view, iconic forms are optimal candidates for signs (= Schelling points).
- Humans are a primarily visual species. Given the possibility of a visual language, it's no wonder that such a species would exploit visual iconicity.

Arbitrariness revisited

- If arbitrariness is a central design feature of human language, and if sign languages are full of iconicity, then the status of sign languages as full-fledged human languages is always in danger.
- “Upplaying” the amount of iconicity in spoken languages is a weak defense.

Arbitrariness revisited, 2

- A stronger defense is to insist on the irreducibly conventional character of morphemes, independently of their iconicity.
- It is this conventionality that allows arbitrariness to emerge in sign languages as a result of factors including:
 - ease of production and perception
 - vocabulary “inertia”
 - increases in vocabulary size

A conjecture: A mode-specific limit on arbitrariness in sign languages

- If signs can develop to be as arbitrary as words in spoken language, upward points could in principle come to mean DOWN, and vice versa.
- We conjecture that such a development is impossible, and that the impossibility is a consequence of the Stroop effect.

An important point about pointing

- Pointing is a distinctively human ability.
- Non-human primates in the wild do not point (Robert Seyfarth, pers. comm., November 17, 2014).
- Chimpanzees in captivity look like they point, but they don't.
- When put to the test, they fail spectacularly (Povinelli et al. 2003).