



Toward a More Tactile Future: Learning from Protactile DeafBlind Communities*

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*This presentation reports findings of a pilot study, which has since been funded by the National Science Foundation

*Photo credit: Windell "Wink" Smith and Gallaudet Department of Linguistics



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Feeling Phonology: Proprioceptive Constructions in Protactile Sign Language

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“Tactile Sign Languages”

Tactile Reception of
Visual Language



Tactile Language

Tactile [name of visual SL]
(Willoughby et al. 2018)



Tactile ASL

Language that *maximizes*
the tactile modality



Protactile Language

Affordances of proprioception in language?

Phonology

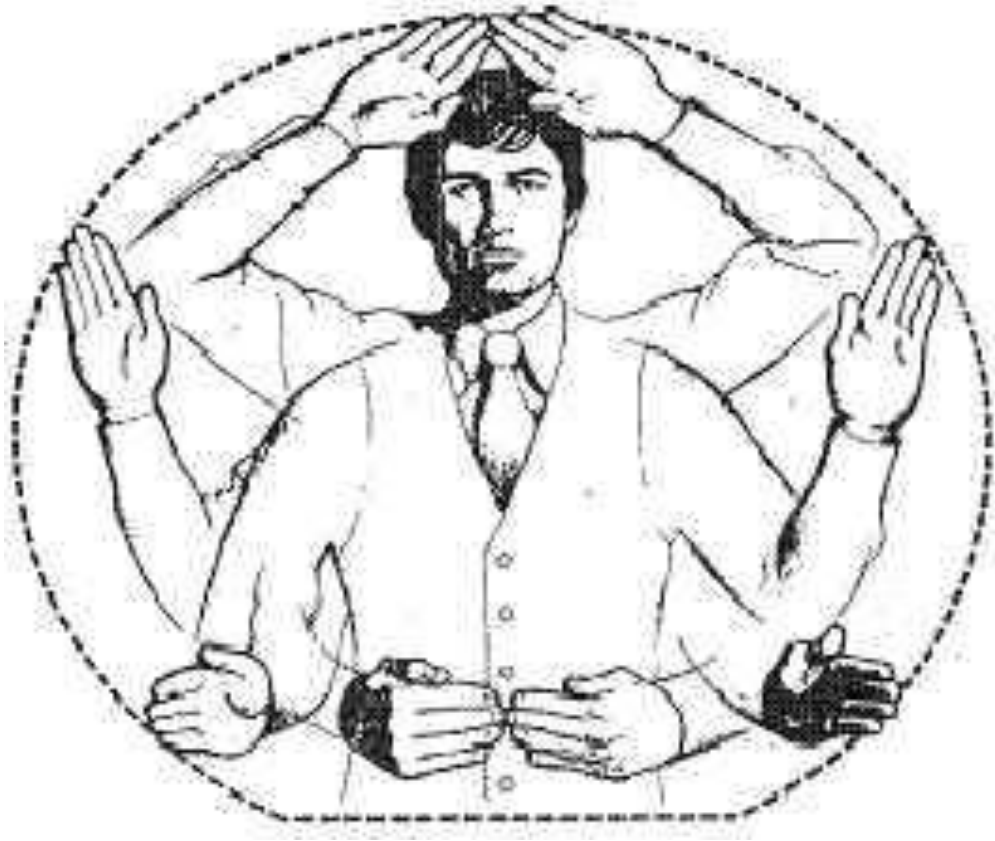
- The physical dimension of structure
- -consonants
- Vowels
- Handshapes
- movements



Syntax-semantics

- Order
 - *this book or book this*
- Meanings
 - Substantive meaning
 - House, book
 - Functional meaning
 - Tense, aspect

How Can Language Maximize the Tactile Modality?



air space is dead space

“Air Space”

(Granda & Nuccio 2018)



“Contact Space”

(Granda & Nuccio 2018)

A photograph showing two individuals, labeled as Signer 1 and Signer 2, interacting with their hands. Signer 2, on the left, is wearing a red shirt and is seen from the side. Signer 1, on the right, is wearing a black long-sleeved shirt and sunglasses. They are both looking towards each other's hands, which are positioned in the center of the frame. The background is dark and indistinct.

Signer 2

Signer 1

Adding Sensory Channels

- Tactile signing

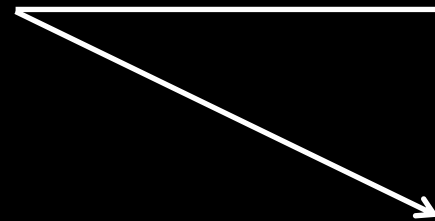


touch

- Protactile Language



touch



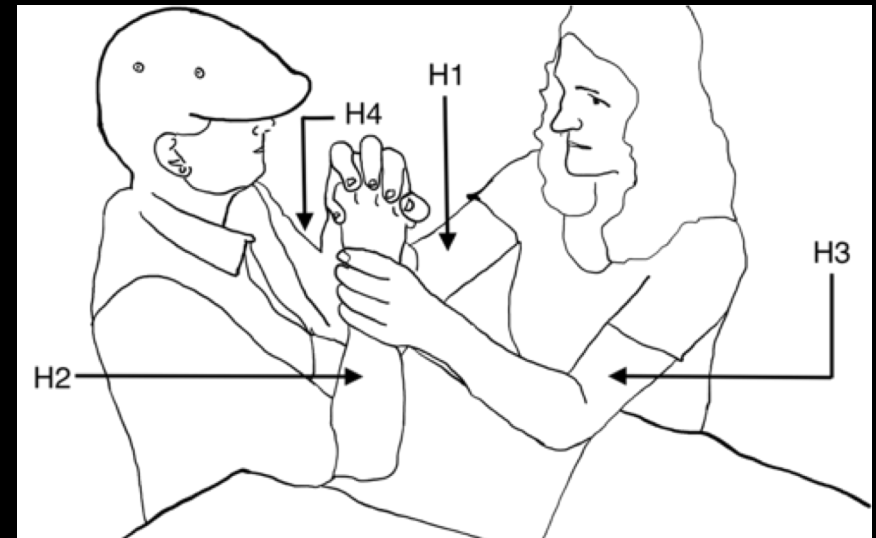
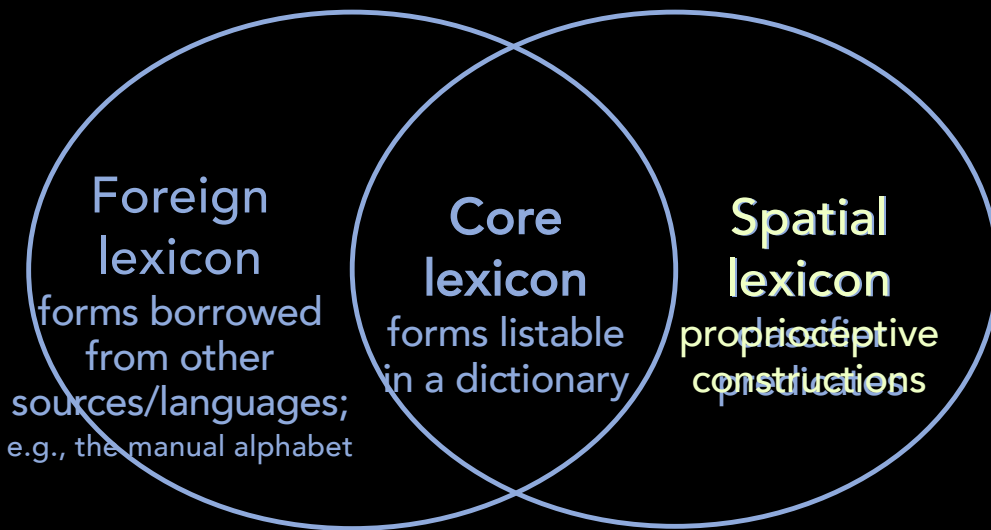
proprioception

Consequences of adding sensory channels

- **4 hands + 2 bodies:** There is more material from which phonological principles can be initiated
- **Two people are needed:** One person cannot produce PT signs alone. There must be effective and efficient ways of requesting Signer 2's participation & coordinating with Signer 1 in articulation of signs
- **Vision is backgrounded; Proprioception/Tactile senses are foregrounded** Units for constructing signs must be distinguishable from one another (a) against a proprioceptive backdrop, and (b) according to tactile/proprioceptive criteria for distinctiveness

Hypothesis

- The structures and functions align in grammatical ways. that are different from ASL.
- In other words, PT signers know what to do with their hands and arms, and when.



Stimuli



Methods

Pilot Study: Data collected in 2016

Participants:

Protactile (PT) DeafBlind signers: 3 males and 3 females, ages 32-47

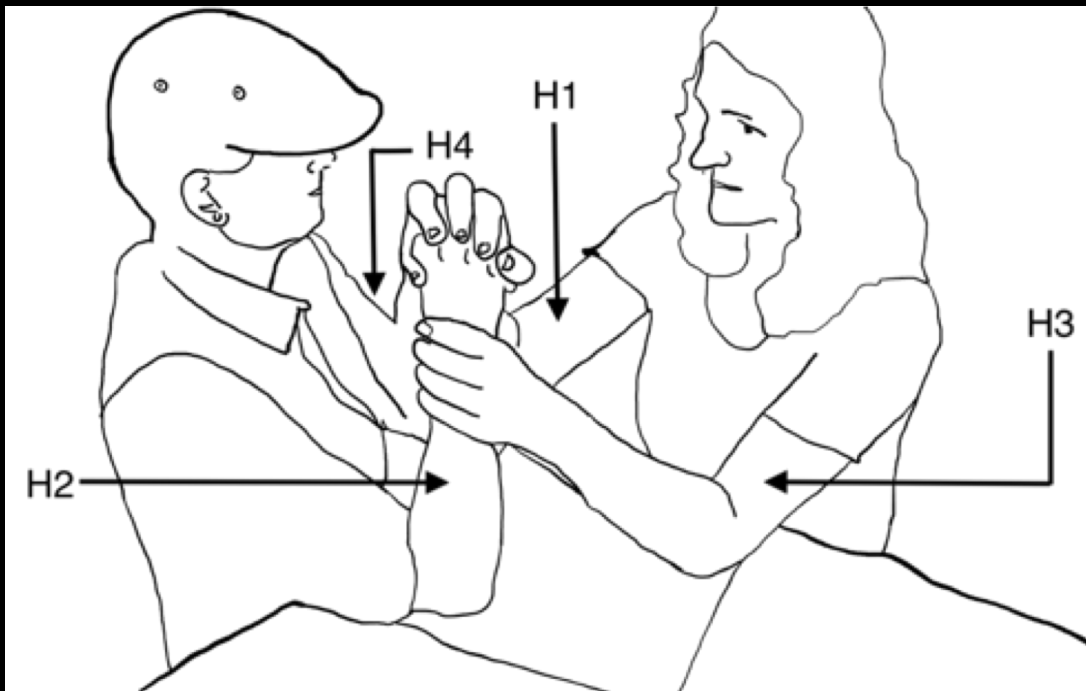
Procedure:

Asked PT signers to explore tactile stimuli and “describe what they feel”

Transcription:

Created a tier for each articulator, identified tasks performed by each one

Articulators



H1: Dominant hand of Signer 1

H2: Dominant hand of Signer 2

H3: Non-dominant hand of Signer 1

H4: Non-dominant hand of Signer 2

Proprioceptive Construction





INITIATE-GRASP [H1]



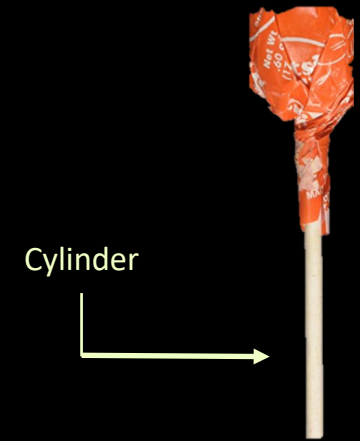
PO-CYLINDER [H2]



PROMPT TO CONTINUE- HOLD [H3]



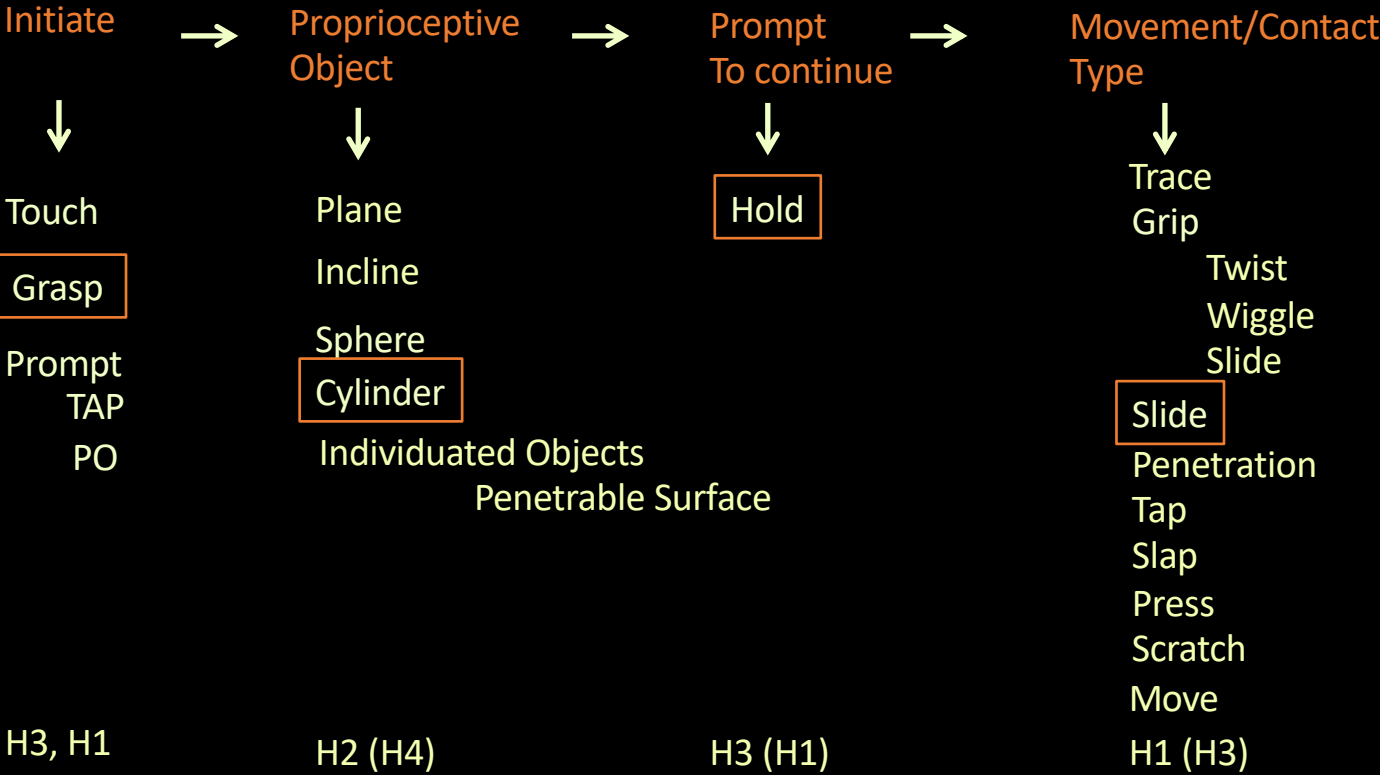
MOVEMENT CONTACT-SLIDE [H1]



The temporal periods of the PC:

1. INITIATE (I)
2. Proprioceptive Object (PO)
3. PROMPT TO CONTINUE (PtC)
4. MOVEMENT CONTACT (MC)

PC: Cylinder





INITIATE-PROMPT-PO [H1]



PO-SPHERE [H2]



PROMPT TO CONTINUE- HOLD [H3]

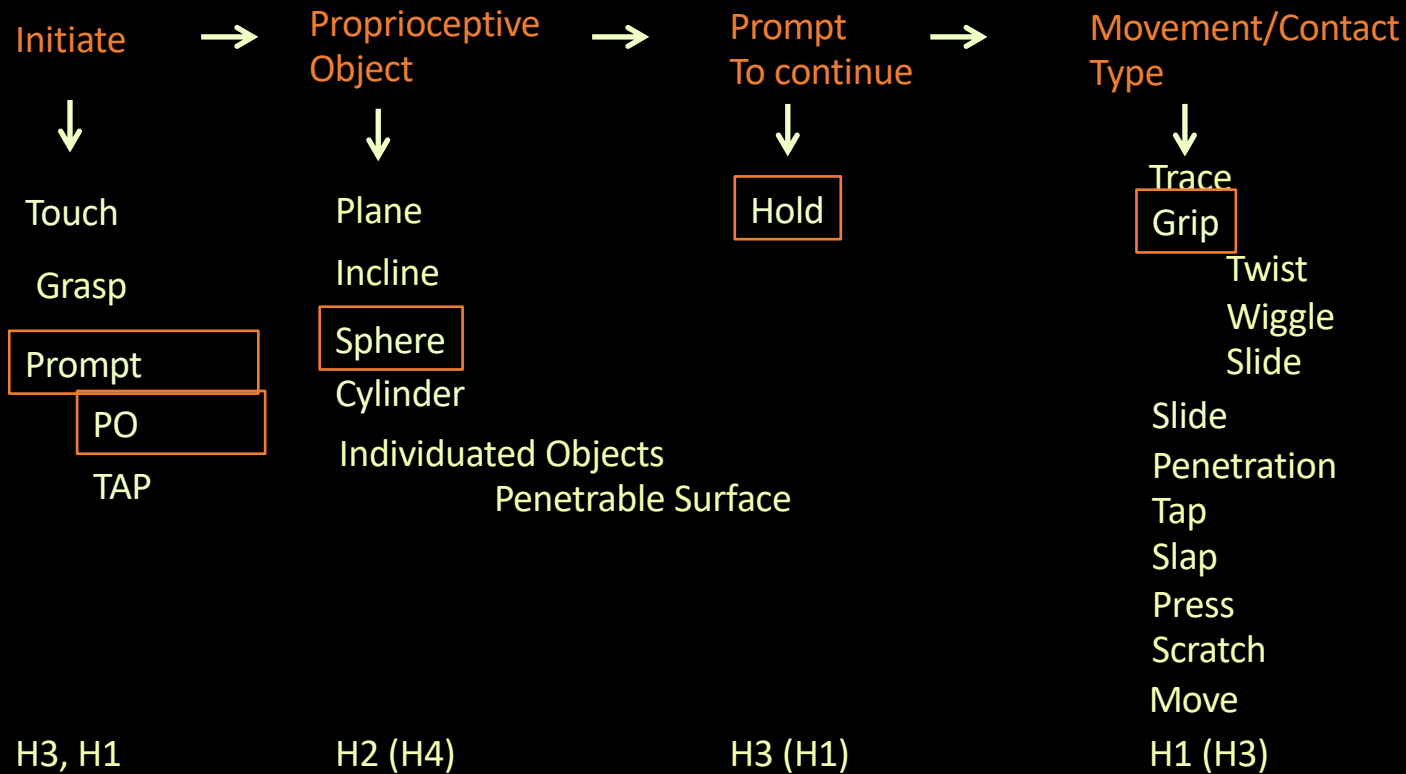


MOVEMENT CONTACT-GRIP [H1]

Sphere

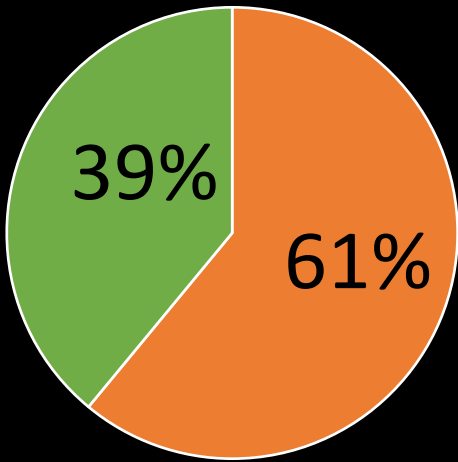


PC: Sphere



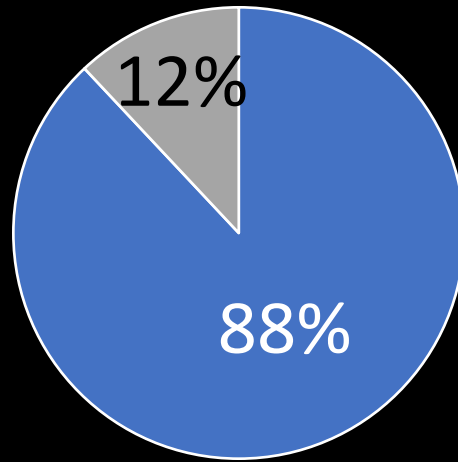
Lexico-Grammatical Units Assigned to Articulatory Structures

Initiate



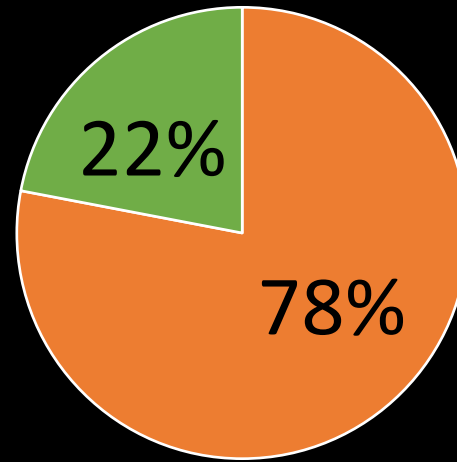
■ H1 ■ H3

PO



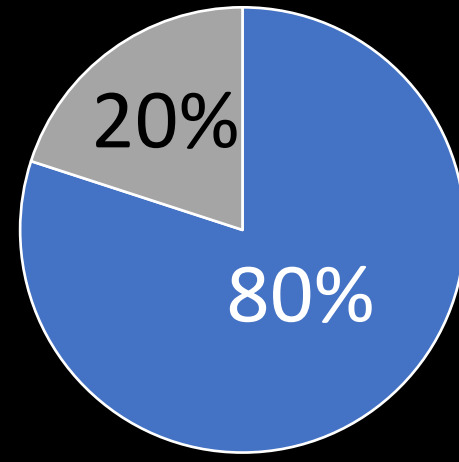
■ H2 ■ H4

PTC



■ H1 ■ H3 ■

MC



■ H1 ■ H3

DeafBlind Tactile ASL Signer



Findings

- PT assigns meaningful roles to 4 articulatory structures in a conventional, rule-governed way.
- The order and form of units in a proprioceptive construction are subject to well-formedness constraints:
 - Constraint on order
 - Redundancy rule
- The functions, articulators, and their associations are different from those of ASL.

Conclusions

- In approximately 10 years, principles of constituent order, redundancy and overall well-formedness in PT have been established that maximize the tactile modality in ways that Tactile ASL does not.
- This provides new insights into how new phonological systems in the tactile modality can conventionalize.
- These are some of the first grammatical rules that have been documented for PT.