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 [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”

(Granda & Nuccio 2018)
“Contact Space”
(Granda & Nuccio 2018)
Adding Sensory Channels

- Tactile signing
- 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
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

Touch

Grasp

Prompt

TAP

PO

Proprioceptive

Object

→

Plane

Incline

Sphere

Cylinder

→

Prompt

To continue

Hold

→

Movement/Contact

Type

Trace

Grip

Twist

Wiggle

Slide

Penetration

Tap

Slap

Press

Scratch

Move

H1 (H3)

H2 (H4)

H3 (H1)

H3, H1

H1 (H3)

Individuated Objects
Penetrable Surface
INITIATE-PROMPT-PO [H1]

PO-SHHERE [H2]

PROMPT TO CONTINUE- HOLD [H3]

MOVEMENT CONTACT-GRIP [H1]
PC: Sphere

Initiate

Touch

Grasp

Prompt

PO

TAP

H3, H1

Proprioceptive Object

Plane

Incline

Sphere

Cylinder

Individuated Objects

Penetrable Surface

Prompt

To continue

Hold

H2 (H4)

H3 (H1)

Movement/Contact Type

Trace

Grip

Twist

Wiggle

Slide

Slide

Penetration

Tap

Slap

Press

Scratch

Press

Move

H1 (H3)
Lexico-Grammatical Units Assigned to Articulatory Structures

- **Initiate**
  - H1: 61%
  - H3: 39%

- **PO**
  - H2: 88%
  - H4: 12%

- **PTC**
  - H1: 78%
  - H3: 22%

- **MC**
  - H1: 80%
  - H3: 20%
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.