The impact of language modality on the linguistic encoding of perceptual categories

Brenda Nicodemus[1] **Lucinda O'Grady Batch[1]** **Asifa Majid[2]** **Karen Emmorey[1]**

1 Laboratory for Language and Cognitive Neuroscience, San Diego State University

2 Max Planck Institute for Psycholinguists, Nijmegen

Introduction

Certain perceptual domains are claimed to be more difficult to put into words (ineffable) than others (e.g., Schachtel 1959). The traditional view is that vocabulary associated with proximal senses (smell, touch, taste) is smaller and less explicit than vocabulary associated with distal senses (vision, sound); however, the claim has not been fully explored across spoken languages nor examined in signed languages.

Effability is characterized by:

- high agreement across responses
- a standard set of abstract lexical signs

Using sensory stimuli created by the Max Planck Institute (Majid 2007), we investigated the effability of sensory descriptions in American Sign Language (ASL).

Predictions

1. ASL responses will mirror effability patterns found in spoken languages (Schachtel 1959).
2. ASL responses will reveal unique iconic mappings due to its visual-gestural modality.

Method

Participants: 13 Deaf native ASL signers from various regions across the U.S.

Task: A Deaf native signer presented sensory stimuli to the participants and asked, "What is that _____ (color/shape/feeling/smell/taste)?"

Analysis: Responses were coded into 3 types: 1) lexical labels; 2) source-based responses; and 3) evaluative responses.

Table 1 : Examples of Response Types

Sense	Lexical Label	Source-based	Evaluative
Vision (Color)	'GREEN'	'O-L-I-V-E'	'PRETTY'
Touch	'CL:4'	'BLANKET'	'NICE'
Taste	'BITTER'	'MEDICINE'	'AWFUL'

This research is supported by a grant from the National Institute of Deaf and Communicative Disorders to Karen Emmorey and San Diego State University Research Foundation (DC010997).
Contact information: bnicodemus@projects.sdsu.edu

Stimuli for Distal Senses

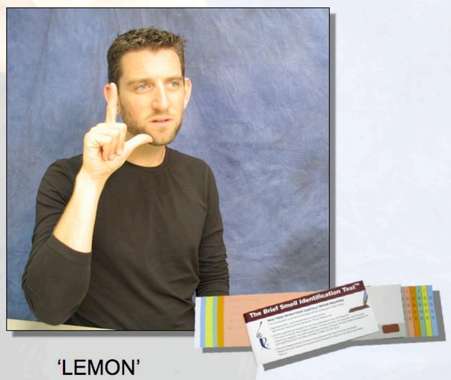
Vision (Color): 80 Munsel color chips
Vision (Shape): 2D and 3D shape forms

'BLUE'

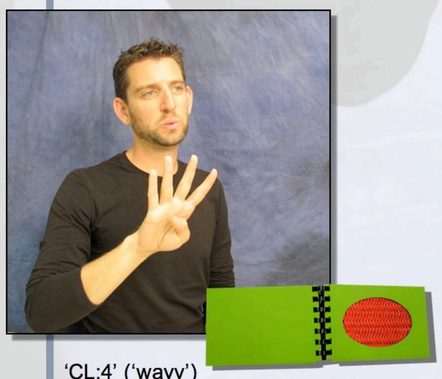
'CL:CIRCLE'

Stimuli for Proximal Senses

Smell: 12 samples in scratch-and-sniff booklet
Touch: 10 textural sensations
Taste: 5 stimuli (sweet, salty, bitter, sour, unami)



'LEMON'



'CL:4' ('wavy')

'SOUR'

Results

Result 1: Effability. The responses in ASL support the claim that more proximal senses (touch, smell, taste) are harder to put into words (ineffable).

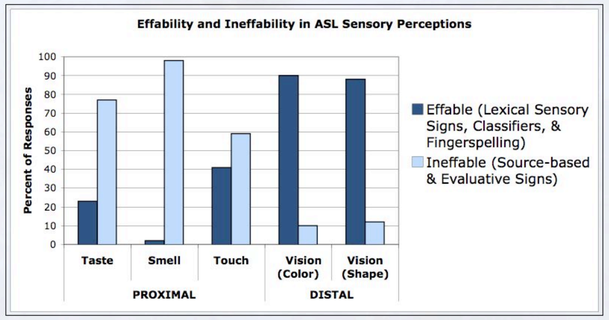


Fig 1: Percent of effability across ASL responses to sensory perceptions

Result 2: Modality. ASL responses revealed unique iconic properties, however use of iconic forms (i.e., classifier constructions) varied across the senses. The proximal or distal status of the sense did not predict degree of iconicity. For example, classifiers were frequently used when describing both Touch (proximal) and Shape (distal) stimuli. Finally, only Shape responses included a unique category of classifier signs that were standard, lexicalized expressions (e.g., CL:CIRCLE).

Modifiers

Twenty-three percent of the lexical labels for Color were modified by facial expressions (e.g., furrowed brows) and movement (I.e., tense, lax), suggesting that standardization of the lexicon creates allowances for more frequent use of facial and manual modifiers.

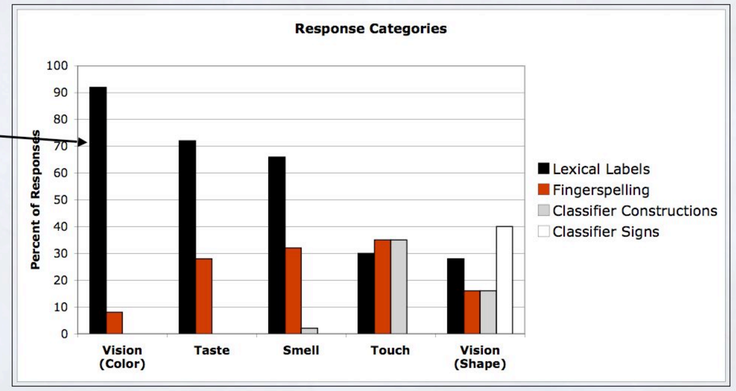


Fig 2: Percent of ASL response types across senses

What about Sound?

A subset of participants (N=11) were asked to describe 10 pairs of tones that varied in loudness, pitch, and tempo (accessed auditorily and/or vibro-tactilely). Only 18% of the responses were source-based descriptions (e.g., TRAIN, HORN) and 36% were lexical sound signs (e.g., LOUD, SOFT). Surprisingly, 46% of the responses were classifier constructions. The frequent use of classifiers revealed that ASL signers created a visual mapping for the auditory stimuli, similar to the Touch responses (See Figure 2).

SOUND STIMULI

'CL:baby O to CL:5'

References

Majid, A. (2007). *Field manual for language of perception*. Nijmegen: Max Planck Institute for Psycholinguistics.
Schachtel, E.G. 1959. *Metamorphosis: On the development of affect, perception, attention, and memory.* New York: Basic Books