USE OF TACTILE AND 3D SYMBOLS FOR COMMUNICATION SUPPORT

Meredith Laverdure, MS CCC-SLP

DISCLOSURES AND RECOGNITIONS

- Nonfinancial: Member of ASHA and SIG 12, employee of Riverside Rehab Hospital, student of Old Dominion University
- Financial: None
- Thanks to Jaime Lawson, MS CCC-SLP and Melonie Melton, MS CCC-SLP for contributions

LEARNING OBJECTIVES

- Describe at least three critical elements for core and fringe vocabulary principles
- Develop at least five treatment considerations using 3D tactile symbols to augment communication modalities across communication settings
- Identify at least two varied patient populations that may benefit from exposure to 3D tactile symbols

COMMUNICATION LEVELS

I. Pre-Intentional
II. Intentional Behaviors
III. Unconventional Communication
IV. Conventional Communication
V. Concrete Symbols
VI. Abstract Symbols
VII. Language

LANGUAGE

- Socially shared rules that include:
  - What a word means
  - How to make new words
  - How to put words together
  - What word combinations are best in what situations

COMMUNICATION BILL OF RIGHTS

ASHA, 2016

Geist, Erickson, Hatch, & Erwin-Davidson, 2016

Brady et al., 2016
WHAT ARE THE LIMITATIONS?

VOCABULARY RESEARCH

Marvin, Beukelman, & Bilyeu, 1994
- Surveyed the language of 10 nondisabled preschoolers at home and at preschool
- Detected similar vocabulary-use patterns at home and at preschool

Banajee, DiCarlo, & Stricklin, 2003
- Researchers studied the vocabulary of 50 toddlers between the ages of 2-3 years old.
- 26 core words made up 96.3% of everything produced by the children included in this study.

Balandin & Iacono, 1999
- Surveyed the language of 34 non-disabled adults
- 347 core words made up 78% of the language sample

Boenisch & Soto, 2015
- Core vocabulary is the same between monolingual and bilingual English speakers.

Robillard, Mayer-Crittenden, Minor-Corriiveau, & Bélanger, 2014
- Core vocabulary is the same between monolingual and bilingual French speakers.

Snodgrass, Stoner, & Angell, 2013
- Conceptually referenced vocabulary can be taught to individuals with intellectual disabilities in initial AAC.

The table below compares the characteristics of core and fringe vocabulary:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Core Vocabulary</th>
<th>Fringe Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Words</td>
<td>Small number of words</td>
<td>Very large number of words</td>
</tr>
<tr>
<td>Frequency of Use</td>
<td>High frequency</td>
<td>Low frequency, occur infrequently</td>
</tr>
<tr>
<td>Applicability Across Environments</td>
<td>Applicable to all environments</td>
<td>Applicable to limited environments, lack versatility</td>
</tr>
<tr>
<td>Applicability Across Topics</td>
<td>Applicable to all topics</td>
<td>Applicable to limited topics</td>
</tr>
<tr>
<td>Types of Words</td>
<td>Includes a variety of parts of speech</td>
<td>Includes mostly proper names and other nouns</td>
</tr>
<tr>
<td>Usefulness in a Single Message</td>
<td>Approximately 80% of the words in a 100-word sample will be core, but many core words will be used repeatedly, so the number of different words is small.</td>
<td>Approximately 20% of the words in a 100-word sample will be fringe, therefore all different words will be large, so fringe words are repeated with much lower frequency than core words.</td>
</tr>
</tbody>
</table>
COMMUNICATION EXPECTATIONS

- Requesting
- Commenting
- Terminating
- Greeting
- Refuting
- Negating
- Asking questions
- Answering questions
- Labeling
- Gaining attention
- Providing personal information
- Expressing feelings

MODES OF COMMUNICATION

- Verbalization
  - Gestures, body language, facial expression, and eye gaze
  - Sign language
  - Objects
  - Symbols, pictures, and no/lite-tech communication systems
- Low/mid-tech communication systems
- High-tech communication systems

MODES OF COMMUNICATION

- Verbalization
  - Gestures, body language, facial expression, and eye gaze
  - Sign language
  - Objects
  - Symbols, pictures, and no/lite-tech communication systems
- Low/mid-tech communication systems
- High-tech communication systems

TACTILE SYMBOLS

- Decreases demands on memory and representational abilities than more abstract symbols
- Relationships
  - Whole objects – direct relationship
  - Partial object – associated relationship

TACTILE SYMBOLS

- Consider for individuals with and without visual impairment
- Sensory processing
  - Haptic – sequential
  - Visual - simultaneous

TACTILE SYMBOLS

- Use auditory cues
  - Noisily presenting the item
  - Continuous use results in dependency on the auditory cue
- Symbols are held, given, or placed
- History of correspondence between the symbol and its referent
### TACTILE SYMBOLS

#### Targeted Word | Symbol
--- | ---
Dismissal | Seatbelt strap
Bathroom | Tile
Music | Bells
Outside | Zipper
Nurse | Band-aid

*Source: Trief, Bruce, Cascella, & Ivy, 2009*

### TACTILE SYMBOLS

- Variables to consider
  - Color
  - Background
  - Borders
  - Shape
  - Pattern
  - Texture
  - Size
  - Position
  - Movement/animation

*Source: Light & Drager, 2007*

### TACTILE SYMBOLS

- Risk of being lost and can’t be exactly matched
- Choking hazard
- Limited to the “here and now”

*Source: Project Core, n.d.b; Rowland & Schweigert, 2000*

### STANDARDIZING TACTILE SYMBOLS

- Continuity, quality, and durability
- Reduces the need for reteaching
- Lack of standardization limits communication partners

*Source: Trief, Bruce, Cascella, & Ivy, 2009; Isserlin, 2012*

### TACTILE SYMBOLS RESEARCH

- High variety of modalities used one at a time
- Limited beyond single-subject design
  - Lack of systematic review
  - Studies focused on requesting
  - >50% made ‘progress’
    - Learning one tangible symbol for communicative purposes

*Source: Sigafoos et al., 2008; Roche et al., 2014*

### STANDARDIZED TACTILE AUGMENTATIVE COMMUNICATION SYMBOLS KIT

- Teach beginning vocabulary
- Activity-based vocabulary

*Source: American Printing House for the Blind, 2014*
TOBIS (TRUE OBJECT-BASED ICONS)

- A photograph or line drawing cut in the shape of the item it represents
- User can see and feel the symbol shape
  - Aids in understanding of a 2-D picture system
  - Interim stage between objects and picture symbols
  - Printed word should accompany the picture, but not in a manner that alters the shape of the symbol

Bell, 2013

AT Considerations, n.d.

TEXAS SCHOOL FOR THE BLIND AND VISUALLY IMPAIRED (TSBVI)

- Large directory of symbols
  - https://www.tsbvi.edu/tactile-symbols
- Designed for the intentional and purposeful communicator
- Purpose
  - Alternate form of communication
  - Organize a routine
  - Label to orient and identify
  - "Concrete support while learning speech or sign language"

Texas School for the Blind and Visually Impaired, n.d.

3D TACTUAL SYMBOLS FROM UNIVERSAL CORE

- Symbol, printed word, and Braille
  - Symbol paired with TSBVI
- Consistent

Geis, Erickson, Hatch, & Erwin-Davidson, 2016

3D TACTUAL SYMBOLS FROM UNIVERSAL CORE

<table>
<thead>
<tr>
<th>Part of Speech</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbs</td>
<td>Red triangles with quarter-like ridges</td>
</tr>
<tr>
<td>Prepositions</td>
<td>Green squares with diagonal ridges</td>
</tr>
<tr>
<td>Adverbs</td>
<td>Yellow circles with bumps</td>
</tr>
<tr>
<td>Adjectives</td>
<td>Blue hearts with smooth edge</td>
</tr>
<tr>
<td>Pronouns</td>
<td>White hexagons with cross-hatched pattern</td>
</tr>
</tbody>
</table>

Geis, Erickson, Hatch, & Erwin-Davidson, 2016

Project Core, n.d.b
3D TACTUAL SYMBOLS FROM UNIVERSAL CORE

- Begin with go, like, or not
- "The Sandwich"
  - When the opportunity occurs, place symbol in dominant hand.
  - Place loop by the fingers with Braille facing up.
  - Say the word or sign hand-under-nondominant hand.
  - Remove symbol.
  - Repeat steps.

3D TACTUAL SYMBOLS FROM UNIVERSAL CORE

- Tap 2× under student’s wrist.
- Student can independently touch 3D symbol or place symbol in his/her hand.

3D TACTUAL SYMBOLS FROM UNIVERSAL CORE

- Introduce more symbols when student begins understanding go, like, and not
- Organize symbols to maximize exposures

3D TACTUAL SYMBOLS FROM UNIVERSAL CORE

CONCLUSION

If you have any questions, ideas, or thoughts to share, please contact me at Meredith.Laverdure@gmail.com