Integrated Multimodal Communication Treatment for Severe Traumatic Brain Injury
Sarah K. Diehl, MS, Sarah E. Wallace, PhD, Joanne Kinney, BS, & Caterina Staltari, MA
Department of Speech-Language Pathology, Duquesne University, Pittsburgh, PA

RATIONALE
- One third of people with traumatic brain injury (TBI) have dysarthria affecting communication
- People with TBI can use augmentative and alternative communication strategies (e.g., gestures, speech-generating devices) to supplement or replace insufficient speech
- Research suggests an integrated multimodal treatment can help people with aphasia use alternative communication modalities to resolve communication breakdowns (e.g., Purdy & Van Dyke, 2011; Wallace, Purdy, & Skidmore, 2014). Implementation of an integrated multimodal treatment may also benefit people with TBI and severe dysarthria

PURPOSE
The purpose of this study was to determine the effect of an integrated multimodal communication treatment on production of communication modalities and success of breakdown resolution by people with severe TBI

PARTICIPANTS
- Three word lists of 10 target nouns each (two treatment, one control)
- Three image sets (two sets of colored line drawings, one set of photographs)
- One 2X5 modality chart
- iPad with Predictable text-to-speech (TTS) application
- Paper and pencils

MATERIALS
- Study Design
  - Multiple baseline, single participant, ABBA Sessions
  - 4 pre-treatment, 20 treatment (10 sessions per phase), and 3 post-treatment sessions
  - All Treatment Sessions:
    - Part 1: integrated multimodal training
    - Part 2: training communicative use of targets
  - Probe Tasks
    - Probe tasks completed during pre-treatment, prior to each treatment, and each post-treatment session

PROCEDURES
- Modality Probe Task:
  - Participant prompted to produce each target word using all modalities
  - Type, number of modalities used, and accuracy of productions recorded

- Referential Communication Task (RCT):
  - Participant communicated each target to a communication partner
  - Partner responded with a correct or incorrect picture based upon the participant’s attempt
  - All communication attempts recorded
  - Switching behavior and communicative repair measured on the second communication attempt

RESULTS
- Total Production of Modalities
  - P1: increased total production of modalities (modality probe) with small significant effect sizes (Robey & Beeson, 2005). Notable improvement in accurate gestures, drawings, and TTS
  - P2: increased total production of modalities with small significant effect sizes for treated lists only. Notable improvement in accurate gestures and drawings

- Initial Nonverbal Successes
  - No significant effect sizes, decreases in standard deviation, increases in mean (P1&P2)
  - P1 during and after phase 2 consistently produced correct initial nonverbal modalities for at least 5 words from each list
  - P2 consistently produced 7 initial nonverbal productions post-treatment (treated lists only)

- Percentage of Modality Switching
  - No significant effect sizes, decreases in standard deviation and increased mean post-treatment (P1 & P2)

- Communicative Repair Score
  - Effect sizes not significant, varied repair opportunities pre- and post-treatment
  - Increased mean and decreased standard deviation post-treatment (P1 & P2-list 2)

- Formal Assessment Scores
  - Negligible to minimal gains

DISCUSSION
- Both participants’ performance on modality probe indicated:
  - Capability to use strategies similar to findings with PWA
  - Strategies not always used in structural functional task (RCT)
- Participants responded differently:
  - P1 required memory supports, P2 required executive function supports
- Future research should examine modifications for people with TBI

This study was supported by a grant from LSVT Global