Impact of task on co-speech gesture in aphasia (with and without comorbid apraxia of speech)

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Introduction & Hypotheses

Aphasia (PWA)

- Result of damage to core language areas after an acquired brain injury, most commonly a stroke, causes difficulty in speaking, listening, reading and writing (UCSF, 2019)
- Characterized as fluent or non-fluent

Apraxia of speech (AOS)

- A motor speech planning disorder that occurs as a result of brain damage to language centers of the brain (Basilakos et al., 2015), characterized by articulatory imprecision, atypical prosody, distorted sound additions or substitutions (Basilakos et al., 2015)

Non-speech gestures are important for meaning and differ from spoken and signed language (Iverson & Goldin-Meadow, 1997)

PWA may particularly rely on co-speech gestures to communicate (UCSF, 2019)

Hypotheses:

1. Frequency and type of gesture will differ between PWA *only* and PWA +AOS
2. Different discourse tasks will show differences in frequency and type of gestures used

Methods: Sample Selection

AphasiaBank database (aphasia.talkbank.org; MacWhinney et al., 2011)

- Includes 300+ speakers with aphasia and 250+ speakers without aphasia

Inclusion criteria

- Matched on education and age
  - Education: 13-18 years
  - Age: 49-73 years
- For all PWA: needed to gesture on both tasks
- For whole sample: hands needed to be visible

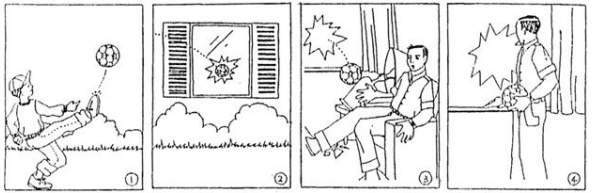
Final sample demographics

- Persons with aphasia (PWA) total group (N=76 included)
  - PWA (aphasia only) (N=33 included)
  - PWA+AOS (with apraxia) (N=43 included)
- Control group (N=39 included)

Methods

Tasks:

- Broken Window, *expositional picture sequence*
- Sandwich, *procedural task*
    - “How to make a peanut butter and jelly sandwich”
    - No image given



Menn et al., 1998

Scoring Gestures (adapted from Sekine and Rose, 2013):

- Referential: any gesture assigned to an object, place or person that was concretely absent
- Iconic observed viewpoint (OVPT): depicted an action, event, or object as if the speaker was observing from afar
- Character viewpoint (CVPT): a speaker depicts an action, event or object as though they were the character or object

Reliability of Rating:

- Raters trained on criteria for how each gesture should be scored, which gestures should be included or excluded as well as how many times a gesture should be counted

Results: Comparing gestures across tasks

- Control group
  - no significant differences in total gestures, types of gestures used, across tasks
- Aphasia group (all members)
  - Use more varieties during Sandwich ($p<.001$)
  - Used a significantly higher proportion of referential and CVPT gestures during Sandwich ($p<.001$)
  - Used a significantly higher proportion of OVPT during Window *$p<.001$)

Take-away message: PWA, but not controls, gesture significantly more in general, with more variety of gestures during procedural task

Results: Comparing gestures across aphasia and aphasia with apraxia of speech

Comparing gesture frequency and type by task (Sandwich, Window) and by group (PWA (no AOS), PWA + AOS).

- Persons with aphasia (only) versus persons with aphasia and apraxia of speech did not show a significant difference in total gestures, gesture variety, or proportion of gestures between tasks ($p>.05$)

Take-away message: concomitant apraxia of speech does not significantly affect amount of gesturing

Summary & Clinical Implications

Conclusions:

- Persons with aphasia gesture more often than controls, in both Window and Sandwich [*Hypothesis supported*]
- Each task produced different number and types of gestures in the aphasia group [*Hypothesis supported*]
- Persons with aphasia and persons with aphasia + apraxia of speech did not differ in their gesture usage or type between tasks [*Hypothesis not supported*]

Clinical Importance:

- To gather a comprehensive profile of gesturing ability (and reliance on gestures) in aphasia, necessary to employ a variety of tasks
  - Improve assessment of extra-linguistic modalities
  - Improve / tailor treatment

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AphasiaBank

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