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Assessing AAC Interaction III: Effect of Task Type on Co-Construction & Message Repair

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AAC-RERC
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INTRODUCTION

Despite significant technological advances in AAC, many augmentative technologies are not designed to facilitate face-to-face social interaction[1,6,8]. The current study extends the work of Higginbotham, et al.[9] by examining the real-time interactions of non-disabled dyads in which one participant used an AAC device.

An underlying goal of any conversation is to achieve sufficient mutual understanding for the task at hand (e.g. telling a story, giving directions, solving a problem, etc.). The process by which participants arrive at a joint understanding of what the speaker has intended is called "grounding" or "achieving common ground". The basic unit of grounding, called a **Grounded Contribution** (GC) may be defined as a the collaborative process in which a signal (e.g. gesture, word, utterance) is successfully understood.

To produce a GC, The AAC speaker may present a series of individual letters, words, gestures, vocalizations, etc. In response, the addressees will typically indicate their acceptance of these utterance parts through sustained attention, repetition, word completion, relevant next turn, contingent query, request for repetition, etc., until a collaboratively grounded contribution is achieved[6].

This analysis focuses on the effect of communication task type on message co-construction and repair of GCs.

Impact Word Predictor / Fujitsu touch tablet used by AAC speaker

METHODS

•Participants. 18 – 12 minute videos randomly sampled from 12 pairs of non-disabled adult dyads in the Higginbotham, et al.[9] study.

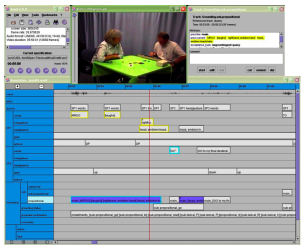
•Device: Enkidu Inpact word predictor (1,975 word dictionary) used by AAC user.

•3 experimental contexts
- Narrative – Unequal role relationship, referents not shared.
- Map – unequal role relationship, referents partially shared.
- Puzzle – equal role relationship, visually shared referents.

•ANVIL[11] used to transcribe and code interactions[5]:
- Utterances (speech, device, vocalizations)
- Meaningful gestures (limb, head/face, task actions)
- Index – pointing gestures
- Illustrator – descriptive gestures (e.g., make a circle)
- Emblems – culturally iconic gestures (e.g., thumbs up)
- Logfile user-device interactions
- Grounded contributions (GC) (*i.e., interactive utterances*). GCs analyzed in terms of frequency and composition (e.g., speech output, vocal & nonverbal behavior).

•ANOVA: Task (Narrative, Map, Puzzle) x Role (AAC, partner), paired comparison, tabular & survival analyses.

•Interrater Agreement: 3 transcribers, 15 hours training, transcription = 86%, coding 87%.



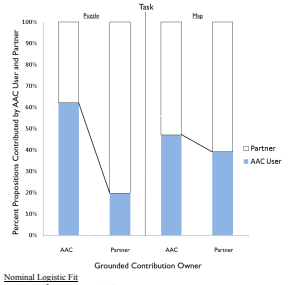
Example of annotation and coding using Anvil software

RESULTS

Co-Construction

- Both AAC users and their partners co-constructed each others contributions.
- Contributions were non-symmetrical with respect to role and differed between tasks.
- The asymmetry between the participant's contributions was more extreme in the Puzzle Task as the grounded contribution owner produced relatively more of the proposition talk compared to the Map Task. This may be due to the fact that the Puzzle Task provided for visually shared referents, allowing the partner equal access to the referent resources for commenting and providing communication support. In the Map Task the partner did not have equal access to the information and had to wait until the AAC speaker produced his message.

Percent of Propositions Contributed by AAC Speaker & Partner across Puzzle and Map Tasks

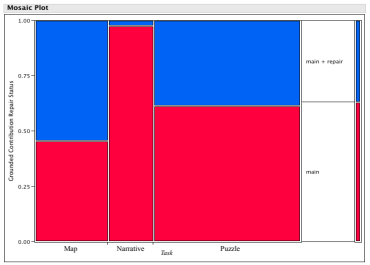


Nominal Logistic Fit
gc_owner: c^2_2 = 40.00 p<.0001*
task: c^2_1 = 2.64, p = 0.1044
task x gc_owner: c^2=. 11.20, p = 0.0008*

Message Repair

- Analysis of the proportion of contributions that were non-problematic versus those that involved misunderstanding and repair indicated significant differences across tasks.
  - Narratives involved little repair.
  - Over 50% of the grounded contributions in the Map Task were involved with repair.
  - Proportionately fewer contributions were involved in message repair in the Puzzle Task.
  - Task-specific repair differences may be related to in the availability of reference materials, participant roles and task procedures.
- Differences in the duration of non-problematic versus repair-related contributions was statistically non-significant.

Percent and Frequency of Main Line Grounded Contributions versus those Communication Repair



Likelihood ratio test X^2_2 = 19.03, p< .0001

DISCUSSION

- Evidence for co-constructed communications supports earlier research[7, 10] as well as Clark's theoretical work on language use[3, 4].
- Finding co-constructed communication for persons without impairments supports the idea that co-construction is a product of technology and task constraints, not just individual limitations.
- Task differences in co-construction and message repair require a reconceptualization of interactive communication and how well AAC technologies successfully address the demands of daily communication tasks.
- Coupled with evidence for multimodal communication displays by the AAC speaker, the use of communication co-construction as a common communication strategy limits the applicability of automated data logging techniques such as the Language Activity Monitor (LAM) for recording important aspects of social communication in daily activity settings.

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