The Effects of Voice Output on Spontaneous Social Spoken Communication in Minimally Verbal Children with ASD

Stephanie Jordan, Lauren H. Hampton & Ann P. Kaiser
Vanderbilt University, Nashville, TN

Introduction

- 30% of children with autism spectrum disorders (ASD) continue to be minimally verbal after age 5 (Anderson, 2007).
- Language in and intervention practices for minimally-verbal children with ASD are poorly understood (Kasari & Target-Flusberg, 2013).
- Joint Attention, Structured Play, Engagement and Regulation (JASPER) is an evidence based intervention targeting joint attention, spontaneous play and emotional regulation in young children with autism (Kasari, Freeman, & Paparella, 2006).
- Enhanced Mileu Teaching (EMT) is a naturalistic language intervention with over 20 years of research to support its effectiveness for children with autism and other developmental disabilities (Kaiser & Roberts, 2013).
- The development of an innovative naturalistic intervention combining these two interventions was examined in a randomized trial (Kasari et al., 2014).
- The addition of a voice-output augmentative and alternative communication (AAC) system to determine if this augmentative mode could increase expressive language for children that are minimally verbal.
- It has been suggested that AAC digital models may increase spoken language because of the consistency of the model (Romski & Sercik, 1996).

Research Questions

1. Is JASP-EMT with AAC use effective for improving spoken and AAC social communication during individual intervention sessions?
   - Hypothesis: Adult AAC use will predict child AAC use and spoken language within intervention sessions.
2. Does adult AAC modeling have an immediate effect on child's spoken communication?
   - Hypothesis: Adult AAC models will result in more frequent child spoken language than adult spoken language models alone.

Method

- **Study 1**
  - 15 minimally verbal children with autism
  - 5-8 years old
  - Session data that included adult models on AAC device
  - 20% of AAC intervention sessions
  - 236 total transcripts
  - Intervention
    - Two 45-minute clinic sessions per week, totaled 48-56 sessions
    - Teach, Model, Coach, and Review procedures used each week to teach parents specific strategies for teaching language
    - Direct intervention from an EMT therapist each session

Procedures and Measures

- **Study 2**
  - A sequential analysis was used with event recorded transcripts from 20% of AAC intervention sessions
  - 118 transcripts were included (this smaller sample is due to low rates of behaviors and could not estimate Yule's Q)

Results

- **Study 1 Results**
  - A multi-level model estimation was used to account for nested session data within participants
  - Build up model selection procedure was used in the 2-level model estimation (Sniders & Bosker, 2012)
  - **Level 1: Session level variables**
    - Prior session performance to account for autocorrelation
  - **Level 2: Individual child per session**
    - **Intercept**
      - **p**<0.0005
    - **T-NOW**
      - **p**<0.0005
    - **Expansion**
      - **p**<0.0005
    - **SGD model**
      - **p**<0.0005
    - **PPVT**
      - **p**<0.0005

- **Yule’s Q estimates were calculated for each transcript:** Yule’s Q = (AD-BC)/(AD+BC)
- **A t-test was used to test the differences between the AAC models and spoken model conditions**
  - Spoken model demonstrated a “moderate effect” (Rosenthal, 1994)

Discussion

- **Controlling for receptive language ability, AAC models did not prove to be a predictor of child language diversity during intervention sessions**
- **Effectiveness of the strategy might be less immediate and more cumulative over time** (Given Kasari et al., 2014 results)
- **JASPER strategy of expanding and adult diversity of language are important predictors of a child’s immediate language use**
- **Sequential analysis results also indicate**
  - Adult spoken models are more powerful than AAC models in the short-term
  - **Limitations:** This study looks at session level summary variables, which does not consider long term benefits of an AAC intervention
- **An important implication for practice is the importance of using expansions with minimally-verbal children with ASD**

Conclusion

- **SGD models do not appear to have an immediate effect on language diversity in minimally verbal children with ASD**
- **SGD use in intervention sessions may have a more cumulative effect rather than an immediate effect**
- **Expansions and language diversity are important strategies for immediately improving child communication**
- **Differential results should be examined for children who cannot imitate speech**

References


More Information: Stephanie Jordan- stephanie.jordan@vanderbilt.edu

This work was supported in part by Autism Speaks grant #50666 and OSEP grant H323D070034