
M. Dare Hicks¹, Brenda L. Beverly¹, Adam Powell², Hanes Swingle², and Amy Mitchell²
¹Department of Speech Pathology & Audiology, Pat Capps Covey College of Allied Health
²Pediatrics, College of Medicine, and the USA Autism Diagnostic Clinic

Introduction

• 1 in 68 U.S. children will have an autism spectrum disorder.
• Autism spectrum disorder (ASD) refers to a continuum of complex neurodevelopmental impairments characterized by deficits in social communication and restricted, repetitive behaviors (American Psychological Association, 2013; Thompson, 2007).
• Assessments and interventions for children with ASD often include play-based interactions, but investigations of toy differences have yielded conflicting results. For example:
  • Beverly, Durden, & Andrasik (2004) found increased vocabulary and longer utterances for children with language impairment and their typically developing peers with parent-selected/familiar toys compared to clinician-selected/unfamiliar toys.
  • Reinhartsen, Garfinkle, & Wolery (2002) found that child-selected toys improved children with ASD’s engagement and behavior in a classroom compared to teacher-selected toys.
• Electronic toys, like television, could be detrimental, but use has increased and children with ASD often prefer electronic toys:
  • Television hours are associated with fewer child vocalizations and their differences in spoken language measures revealed greater quantity and quality of verbalizations based on the spoken language measures compared to children with ASD (p < .02).
  • There were no statistically significant differences for children’s and parents’ spoken language across the 3 toy conditions (p > .05).
  • During book reading, both groups of children gestured more, and parents had increased lexical diversity and longer utterances.
  • Reciprocal exchanges decreased (i.e., parents talked more) but this did not reach statistical significance.

Research Questions

• Are there differences in spoken language, gesture use, and reciprocal exchanges from language samples for children and parents when playing with electronic toys, books, and non-electronic toys?
• Are there differences in spoken language, gesture use, or reciprocal exchanges during language samples for parents and children with ASD compared to neurotypical peers and their parents?

Method

Participants

• 7 children (6 boys, 1 girl) with ASD, ages 2 – 4 years old (M = 46 mos.), were recruited from the Autism USA Diagnostic Clinic
  • Participants with ASD had confirmed diagnoses based on the Autism Diagnostic Observation Schedule (ADOS).
  • All participants had language skills below age-level expectations.
  • 7 neurotypical children matched for age (M = 45 mos.) and sex were recruited via word-of-mouth and approved social media announcements.
  • Neurotypical participants had to have no previous developmental or language concerns.

Parent-Child Language Samples

• Parent-child interaction was video recorded for 15 minutes total:
  • 5 minute intervals with each of the 3 toy conditions.
  • All video recordings were transcribed by the 3rd author.
  • Transcripts were then coded by the 1st author for analysis using the Systematic Analysis of Language Transcripts (SALT; Miller, J., & Iglesias, A. (2012). Systematic Analysis of Language Transcripts [Computer Software]. Middleton, WI: SALT Software, LLC).
  • The following spoken language measures were computed using SALT:
    • number of different words (NDW),
    • number of total words (NTW),
    • mean length of utterances (MLU)
  • The frequency of gestures was counted by the 3rd author.
  • Reciprocal exchange in conversation was determined by the ratio of parent to child speaking turns using SALT.

Results

• Children who were neurotypical had statistically greater quality and quantity of verbalizations based on the spoken language measures compared to children with ASD (p < .02).
  • There were no statistically significant differences for children’s and parents’ spoken language across the 3 toy conditions (p > .05).
  • During book reading, both groups of children gestured more, and parents had increased lexical diversity and longer utterances.
  • Reciprocal exchanges decreased (i.e., parents talked more) but this did not reach statistical significance.

Discussion

1. Spoken language measures revealed greater quantity and quality for neurotypical children when compared to children with ASD, which was expected because children with ASD had identifiable language deficits.
   • There were no group differences in parents’ spoken language.
2. Overall hypotheses regarding communication differences in various toy conditions were not supported with this small sample and large variability.
   • Trend (p < .10) for increased number of total words in non-electronic toy condition for both groups (2 X more words for group with ASD on average).
   • Trend (p < .10) toward an interaction for mean length of utterance with increased MLU for group with ASD and electronic toys but decreased MLU for the neurotypical group in that condition.
3. If handheld electronic devices are motivating and do not interfere with language and social communication, then future research could investigate their use in treatment activities.
   • Although the gestures were not categorized by type, it is likely that this was based on pointing.
5. When assessing ASD, book interactions could be effective to elicit gesture use.
   • This could be beneficial when assessing communication skills for pre-verbal or minimally verbal children.
   • Book reading also could provide a context for intervention focused on increasing joint attention and pointing.

Acknowledgments

• This research was supported by a grant from the University of South Alabama’s Summer Undergraduate Research (UCUR) Program awarded to the 1st author the summer of 2015.
• Thank you to the families who participated in this study, and thank you to the members of the Child Language Lab for your ongoing encouragement and support.