Title: Sustained Attention in Young Children with Fragile X Syndrome or Nonsyndromic Autism Spectrum Disorder

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Introduction: One’s ability to sustain attention is a marker of cognitive development and plays a crucial role in child language acquisition (Ebert & Kohnert, 2011). Sustained attention has been shown to be more limited in children with developmental disabilities compared to their typically developing peers (Krakow & Kopp, 1983; Cielinski et al., 1995). Both children with fragile X syndrome (FXS) and children with nonsyndromic autism spectrum disorder (nASD) are at an increased risk for attentional difficulties. To date, however, limited work has been done to address how sustained attention might be differentially affected in these diagnostic groups. Further, little is known with regards to the association between sustained attention and child cognitive abilities, such as nonverbal cognition and language acquisition, or ASD symptomatology in these populations. Thus, the present study attempts to address these gaps in the literature by looking at how sustained attention might differ between children with FXS or nASD both in features of sustained attention and their association with other aspects of behavioral functioning.

Method: 44 boys between the ages of 3 and 5 years old participated in a study on early word learning. Of these boys, 25 were diagnosed with nASD (M(CA) = 4.59, M(NVIQ) = 76.04, M(ASD symptom severity) = 6.96) and 19 were diagnosed with FXS (M(CA) = 4.20, M(NVIQ) = 58.58, M(ASD symptom severity) = 5.78). Sustained attention was measured across two contexts: (1) during a 3-minute table top activity designed to assess individual differences in attention/persistence (i.e., Lab-TAB Coffee Pot task; Goldsmith et al, 1999) and (2) during a 5-minute portion of a semi-structured parent-child play sample (Communication Play Protocol, Adamson et al., 2009). During the Coffee Pot task, children were shown the different parts of a percolator and instructed to take it apart and play with it in any way they like. During the play sample, 3 toys were placed out of reach of the child and mothers were instructed to help the child get what they want, but only after pretending to misunderstand what he wants (i.e., first giving the child the wrong toy). Samples were coded for when the child’s visual attention was on the target objects over the course of the trial. Measures derived from this include the proportion of the trial spent attending, number of looks away, the length of longest look, and the latency to first look away. Caregivers completed the ADHD Rating Scale – Preschool Version (McGoey et al., 2007). Child nonverbal cognition was assessed using the Differential Ability Scales-II (DAS-II; Elliott, 2007). Measures of child language were assessed through parent report, standardized measures of language, and child language during the play sample with a parent.

Results: Caregiver’s were more likely to endorse inattention in boys with FXS compared to boys with nASD (MFXS = 25.38 vs M ASD = 16.89). On the Lab-TAB Coffee Pot task, boys with FXS were more likely to shift attention away from the target (MFXS = 6.89 vs M ASD = 4.40) and demonstrated shorter latencies to initial attentional shift (MFXS = 15.77 vs M ASD = 39.53) than did boys with nASD, even after controlling for between group differences in nonverbal cognition. However, the proportion of time spent attending and the length of longest look did not differ between the groups. Nonverbal cognition was significantly and positively related to attention in FXS but not in nASD. The length of longest look during the Lab-TAB task was significantly and positively related to child language in the FXS group, however this finding was no longer significant after controlling for nonverbal cognition. For the nASD group, the number of looks away during the Lab-TAB task was significantly and positively associated with child language, even after controlling for nonverbal cognition. Lastly, we considered whether similar patterns emerged when observing child attention to objects during parent-child play. For both groups, associations between attention and child language were not observed after controlling for nonverbal cognition. ASD symptomatology was not related to attention in either group.

Discussion: Results from the present study suggests that boys with FXS and boys with nASD differ in their attention skills. Despite having similar looking times, children with FXS were observed to shift attention more quickly and more often than the participants with nASD. Between group differences were also observed in terms of how attention was related to nonverbal cognition and child language. Interestingly, patterns differed across the two contexts. Coding is ongoing to capture additional attentional components in these interactions and to describe how parental behavior might influence child attention during naturalistic interactions. Theoretical and clinical implications will be discussed.
References/Citations:


