Title: Gaze Use in Male Preschoolers with Fragile X Syndrome or Autism Spectrum Disorder: Effects of Etiology and Sampling Context

Authors: Akilan Murugesan\textsuperscript{1}, Claudine Anglo\textsuperscript{2}, Leona Kelly\textsuperscript{3}, Angela John Thurman\textsuperscript{2}

\textsuperscript{1}Department of Public Health, Tulane University, \textsuperscript{2}Department of Psychiatry and Behavioral Sciences, MIND Institute, University of California, Davis

Introduction: Gaze use provides a powerful tool for establishing a communicative link with other people. Gaze use indicates a person’s social interest and engagement, communicates information about emotional and mental states, and sets the foundation for learning both about and from the surrounding world of people (Farroni et al., 2002; Mundy et al., 2009; Baron-Cohen et al., 1997). Atypical gaze use is commonly observed in both children with fragile X syndrome (FXS) and children with autism spectrum disorder (ASD). In fact, atypical gaze plays a key role in discussions surrounding the co-occurrence of ASD in individuals with FXS, particularly young children, because it can negatively influence all three social affective symptoms of ASD outlined within the Diagnostic and Statistical Manual-5 (social-emotional reciprocity, nonverbal communicative behaviors used for social interaction, and the ability to develop, maintain, and understand relationships). Thus, research focused on understanding the similarities and differences between the FXS and ASD phenotypes in gaze use across contexts and the relations between gaze use and other behavioral characteristics will aid our understanding of the role gaze plays in the development of these phenotypes. In the present study, we examined gaze directed toward a communicative partner in two contexts (free-play with a caregiver and structured play with an examiner) in preschool-age boys with FXS or ASD, with a focus on understanding how gaze use might differ between boys with FXS and boys with ASD in (1) their occurrence across contexts, and (2) their association with other aspects of behavioral functioning.

Method: Participants were 20 males with FXS (CA(M) = 4.20; IQ(M) = 57.38, ASD severity (M) = 7.07) and 31 males with ASD (CA(mean) = 4.35; IQ(mean) = 72.67) between the ages of 3 and 5 years. Gaze use was considered in two contexts: (1) in response to being given a toy by the examiner in a structured task (“Give Task”) and (2) during semi-structured play with parent (“Parent-Child Play”). During the Give task, an examiner would hand the child a toy with no direct attempt to solicit eye contact from the child (Phillips et al., 1992). Instances in which the child looked to the examiner’s face within 4 seconds of being given the toy was considered a look. A total of six trials were administered for this task, which were embedded in a play-based task at a table with the examiner. Our Parent-Child Play task involved a 10-minute portion of a semi-structured parent-child play sample (Communication Play Protocol; Adamson et al., 2009). During this 10-minute sample, all looks to the caregiver’s face were coded and tallied to generate a frequency count of total looks. Data were also collected to consider other aspects of children’s behavioral functioning, including children’s nonverbal cognitive ability, language ability, and severity of ASD symptomatology.

Results: Results indicated that in both contexts, boys with FXS were significantly more likely to look at their communicative partner than boys with ASD. These between-group differences remained even after controlling for the effects of chronological age, IQ, and ASD symptom severity. Interestingly, gazes in the Give task was not significantly associated with gazes in the Parent-Child Play session for either diagnostic group. Moreover, different patterns emerged, as a function of both diagnostic group and context, in terms of the factors associated with gaze behavior. For the Give task, gaze behavior was correlated with language performance in boys with ASD, but not boys with FXS. In contrast, gaze behavior in the Give task was correlated with anxiety in boys with FXS, but not boys with ASD. For the Parent-Child Play session, no significant associations were observed between gaze behavior and any of the other child characteristics considered, for either diagnostic group.

Discussion: Although rates of gaze were low in both boys with FXS and boys with ASD, results from the present study demonstrate that boys with FXS still demonstrate a strength in looking relative to their peers with ASD. In addition, our findings demonstrate that the relations between gazing and other aspects of behavioral functioning differ depending on context. During a structured interaction with a caregiver, we found that for boys with ASD, gaze behavior was associated with language performance and that for boys with FXS, gaze behavior was related to anxiety symptomatology. However, neither of these findings were observed when considering gaze behavior during a parent-child interaction. Coding is ongoing to identify additional factors related to the differences observed across contexts, such as how parental behavior might influence child attention. Theoretical and clinical implications will be discussed.
References/Citations: