Title: Language Performance in Preschoolers with Fragile X Syndrome or Nonsyndromic Autism Spectrum Disorder

Authors: Karina Gonzalez, Emma Cooper, & Angela John Thurman

Introduction: Previous research has indicated numerous neurobiological and behavioral similarities between fragile X syndrome (FXS), an X-linked neurodevelopmental disorder, and autism spectrum disorder (ASD), a multifactorial, behaviorally defined neurodevelopmental disorder. To date, most of the research comparing these conditions has focused on symptoms central to a diagnosis of ASD. Language is a socially learned ability that is critical for human interaction. Elucidating the similarities and differences in language development is a particularly interesting area of investigation given the fact that both conditions are characterized by socio-cognitive difficulties that are likely to negatively influence the ways in which language is learned. In a previous study, Thurman et al. (2015) observed a language weakness in ASD relative to boys with FXS even after controlling for between group differences in nonverbal cognitive ability and autism symptom severity; however, it is still unclear when these between-group differences emerge. Thus, the present study attempts to characterize language skills of preschool aged boys with FXS and preschool aged boys with ASD.

Method: Participants were 12 preschool aged boys with FXS (M(CA) = 4.56, M(NVIQ) = 71.08) and 17 preschool aged boys with ASD (M(CA) = 4.81, M(NVIQ) = 75.88) who ranged from 3.00 – 5.50 years of age. Participants in the two groups were matched on nonverbal reasoning ability (p = .50). Each participant was administered measures of language (Differential Ability Scales Verbal Cluster, Peabody Picture Vocabulary Test, Expressive Vocabulary Test) nonverbal reasoning (Differential Ability Scales Nonverbal Reasoning Cluster) and autism symptomatology (Autism Diagnostic Observation Schedule).

Results: Exploration of the patterns of performance across cognitive abilities indicated that 47% of boys with ASD and 25% of boys with FXS demonstrated verbal skills that were significantly weaker than their nonverbal reasoning skills. Within the area of vocabulary, 35% of boys with ASD and 33% of boys with FXS demonstrated expressive vocabulary skills that were significantly weaker than their receptive vocabulary performance. In both diagnostic groups, nonverbal reasoning performance was significantly and positively associated with verbal performance (ASD: rs = .61 - .68; FXS: rs = .60 - .86). In addition, a significant association was observed between overall ASD severity and language performance in FXS (rs = -.39 to -.56) but not ASD (rs = -.14 to -.28).

Discussion: Results from the present study suggest that during the preschool period more boys with ASD demonstrate a language weakness; that is language skills that are significantly weaker than their nonverbal reasoning skills, than boys with FXS. Rates of a weakness in expressive vocabulary, relative to receptive vocabulary skills, were comparable between the two groups. For both preschoolers with FXS and preschoolers with ASD, verbal skills were strongly associated with nonverbal reasoning skills. For boys with FXS, language performance was significantly associated with overall ASD severity, such that boys with more severe ASD symptomatology were observed to demonstrate weaker language skills. This association between ASD symptomatology and language performance was not observed in the preschoolers with ASD. These findings suggest that differences in language skills in these populations are seen early in development. Previous research has documented, even when matching individuals with FXS or ASD on overall levels of ASD symptom severity, some between-group differences that remain within the area of social reciprocity favoring the FXS group (McDuffie et al., 2015). It may be that these social-affective strengths allow those with FXS, as compared those with ASD, to accumulate more learning experiences over time thereby facilitating language acquisition. More thorough investigations of early language development in each of these conditions has the potential facilitate the development of methods by which children with FXS or ASD can be given access to a more optimal range of learning opportunities and provide insight into the complex mechanisms that underlie language development in these conditions. Data collection is ongoing.
References/Citations:
