Title: Autism Symptoms in Adolescents and Young Adult Males with Fragile X Syndrome: Predictors of ADOS Severity Scores

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Introduction: Symptoms of autism are frequent in males with fragile X syndrome (FXS), the leading inherited cause of intellectual disability, yet the psychological mechanisms underlying the social-affective deficits and the presence of repetitive behaviors in FXS are not yet well understood. Several studies in our lab have previously identified important developmental factors associated with autism symptoms in young boys with FXS during the early school age period. For example, we have found that chronological age and nonverbal cognitive ability predict ADOS social-affective severity scores. In addition, we have found that restricted and repetitive behaviors are predicted by nonverbal cognitive ability, expressive vocabulary ability, and anxiety. To date, few studies have considered the factors associated with the presence of autism symptoms in older individuals with FXS. Such data could provide insights into the developmental course of autism symptoms in FXS. Thus, the goal of the current study was to examine the concurrent roles of age, nonverbal cognitive ability, anxiety, and expressive language in influencing the presence of autism symptoms in a group of male adolescents and young adults with FXS.

Research Questions:
1. What are the concurrent predictors of social-affective symptoms of autism in adolescent and young adult males with FXS?
2. What are the concurrent predictors of restricted and repetitive behavior symptoms of autism in adolescent and young adult males with FXS?

Method: Participants were 58 males with FXS between the ages of 15 and 23 years of age who were enrolled in a longitudinal study of language development. Data for the current study were from the first annual assessment. Participants received a battery of standardized assessments, experimental procedures, and informant report measures. For the current study, dependent measures were calibrated ADOS severity scores for the social affective and restricted and repetitive behavior domains. Social-affective severity scores ranged from 1-10. Repetitive behavior severity scores were converted to a continuous scale and ranged from 1-7. Concurrent predictors were chronological age (CA), nonverbal cognitive growth scores, the Social Avoidance subscale of the Anxiety, Depression, and Mood Scales (ADAMS; Esbensen et al., 2003), and a composite measure of expressive language derived from the Expressive Vocabulary Test (EVT) and the syntax construction subtest of the Comprehensive Assessment of Spoken Language (CASL). Participants had an average nonverbal IQ of 39 (range 36-56), and calibrated severity scores of 5.76 (range 1-10) and 3.77 (range 1-7) on the social affective and repetitive behavior domains of the ADOS, respectively. Standard scores for expressive language were 59 (range 20-97) for the EVT and 42 (range 40-72) for the CASL.

Results: For social-affective severity scores, there was a significant bivariate correlation with the expressive language composite (r(51) = -.32, p<.03) and a marginally significant correlation with nonverbal cognitive growth scores (r(57)= -.247=p<.06). For repetitive behavior severity scores, there was a significant bivariate correlation with the Social Avoidance Scale of the ADAMS (r(51)=.343, p<.007). Age was not a significant correlate of either severity score. Nonverbal cognitive growth score was a unique predictor of social-affective severity over and above the contribution of age but not after including expressive language in the regression analysis. ADAMS Social Avoidance remained a unique predictor of repetitive behavior severity scores over and above the contributions of age and nonverbal cognitive growth score.

Discussion: This study confirmed the negative association between nonverbal cognitive ability and social-affective symptoms of autism for adolescents and young adult males with FXS. Findings suggest a positive association between socially avoidant behaviors and restricted and repetitive behaviors. In addition, the factors observed to predict autism symptomatology in adolescents and adults with FXS differ somewhat from those that have been observed during the preschool and early school-age...
period. Understanding how autism symptoms are moderated by expressive language, nonverbal cognitive ability, and socially avoidant behaviors is critical for developing meaningful clinical interventions.

References/Citations: