Title: Gesture Use Associated with Receptive and Expressive Language Skills in 24-month-old Children with Fragile X Syndrome

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Introduction: Fragile X syndrome (FXS) is a heritable genetic disorder that results in a range of physical, intellectual, and behavioral abnormalities. Children with FXS demonstrate severe delays in language development, particularly in expressive language (Roberts, Mirett, & Burchinal, 2001). Infants with FXS have also been shown to have delayed development of gesture use (Hughes, K.R., et al. 2019; Rague et al., 2018; Roberts et al., 2002). In typical development, gestures emerge early in infancy and play a large role in later development of language (Rowe, 2008; Tomasello et al., 2007). Studies have revealed a stronger relation between gesture use and receptive language rather than expressive language in both children with general language delay (LD) and autism spectrum disorders (ASD) (O’Neill & Chiat, 2015; Manwaring, et.al, 2017). Preliminary findings on the relationship of gesture predicting vocabulary in children with FXS were largely inconclusive based on sample size (Flenthrope & Brady 2010), and no studies have focused on the relationship of gesture use to language in toddlers and preschoolers with FXS. As such, the current study addresses an important gap in the literature by leveraging data from a large well-characterized sample utilizing parent-report as a comprehensive measure of gesture use in early childhood. The current study aims address the following research question: Is gesture use related to expressive and receptive language in FXS, and is this pattern different from what is observed in typical development?

Method: Participants included 38 children with FXS (mean age = 25.18 months), and 33 typically-developing (TD) controls (mean age = 24.49 months). Receptive and expressive language abilities were measured at 24 months using the raw scores on the Mullen Scales of Early Learning (MSEL; Mullen, 1995) Receptive Language and Expressive Language subscales, respectively. Gesture use was measured via parent report using the Early Gesture raw scores on the MacArthur Communicative Development Inventories (MB-CDIs; Fenson, et al. 2007). Independent samples t-tests were run to test group differences in gesture use, receptive language, and expressive language. Two univariate general linear models were run to determine if gesture use scores are related to receptive language and expressive language raw scores. The main effects of group and gesture use, as well as the group*gesture score interaction, were included as independent variables in the models.

Results: Independent samples t-tests indicated that the TD group had higher gesture use, (t(69) = 5.628, p = .000), receptive language, (t(69) = 9.962, p = .000), and expressive language, (t(69) = 6.664, p = .000). A univariate general linear model indicated that both group (F(1,67) = 5.48,p= .022), and gesture use score, (F(1, 67)=7.220,p=.009), were significantly related to receptive language raw score. The group*gesture score interaction was non-significant, (F(1, 67) = 0.882,p=.351), suggesting that the relationship between gesture use and receptive language was similar across groups. The second model indicated that group was not significantly related to expressive language, (F(1, 67) = .087,p= .769), though gesture use score was (F(1,67) = 28.193, p = .000). The group*gesture score interaction was non-significant, (F(1, 67) = 0.148,p = .708), suggesting that the relationship between gesture use and expressive language was similar across groups.

Discussion: Results suggest that children with FXS have significantly lower receptive and expressive language skills and less gesture use than their typically developing peers at 24 months of age, which is congruent with previous research. Additionally, results of this project add to the current understanding of the relation of gesture use and language development in infants with FXS; indicating that gesture use is significantly related to receptive language as well as expressive language in both children with FXS and their typically developing peers, and this relation is evident as early as 24 months. These findings support the importance of the role of gesture use in the acquisition of both receptive and expressive language in both typically developing children and those with FXS. The results of this project have implications for intervention targeting acquisition of communicative gestures.
References:


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