Title: The Relationship of Early Mother-Child Dialogic Reading & Later Communication Skills in Children with Fragile X Syndrome

Authors: Michaela Leahy¹, Lindsay Williams¹, Kandace Fleming¹, Steven F. Warren¹

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Introduction: Parent-child interactive book-reading, or “dialogic reading” (DR), has been shown to promote literacy and academic skills in children. The implementation of DR activities has been correlated with significantly improved language scores in typically developing children. This study aims to explore the use of DR strategies in children with Fragile X Syndrome (FXS), a population with a documented pattern of language and literacy delays. Specifically, we investigated whether the use of DR strategies by mothers of children with FXS was predictive of later language and vocabulary development after controlling for child autism symptomatology and nonverbal IQ.

Method: Participants included 50 children with FXS (male n=39, female n=11) and their mothers who were recruited as part of an ongoing longitudinal study of FXS at the University of Kansas. Data were collected and analyzed from two time points: Time 1 (T1) (M age=3;9 yrs) and Time 2 (T2) (M age= 9;8 yrs). The Childhood Autism Rating Scale, 2nd Edition (CARS) was used to estimate autism symptomatology during each visit (CARS M=26.14, SD 5.75) and the Mullen Scales of Early Learning (MSEL) was used to estimate non-verbal IQ (M NVIQ=52.6).

Five-minute videos of mother-child book-reading at T1 were scored by two raters (reliability >80%) using a modified version of the Dialogic Reading Inventory (DRI), which evaluates 17 DR behaviors in 4 domains: print awareness (PA), supporting vocabulary comprehension (VOC), phonemic awareness (PHA), and attention to text (ATT). Strategies supporting PA (M=0.06, SD 0.31) and PHA (M=0.02, SD 0.14) were rarely used by mothers at T1, so VOC (M=28.86, SD 15.10) and ATT (M=12.36, SD 5.56) were the focus of the analysis. Two multiple linear regression models were used to test if mothers’ raw scores from the VOC and ATT domains were predictive of language as assessed by the Vineland Adaptive Behavior Scales, 2nd Edition, Communication domain (VABS) or vocabulary as assessed by the Peabody Picture Vocabulary Test, 4th Edition (PPVT-4) at T2. In each model VOC was entered as the first predictor and ATT as the second predictor. Autism symptoms and nonverbal IQ were added to the regression models together as a last block in order to examine the unique contribution of other predictors after controlling for these child characteristics known to be related to language and vocabulary outcomes.

Result: The regression results indicated that the model explained 58.7% of the variance in the VABS scores, and 73.5% of the variance in the PPVT-4 scores. Examination of the part correlations squared in the full model indicates the unique variance accounted for by each predictor. Mullen NVIQ and CARS scores explained significant unique variance in both VABS and PPVT–4 outcomes (p<.001). VOC scores explained significant unique variance in only the PPVT-4 model while ATT scores were not significant in either model. NVIQ scores uniquely accounted for 12.5% of the variance in VABS and 7% in PPVT–4. CARS scores uniquely accounted for 9% of the variance in VABS and 21.5% in PPVT–4. VOC uniquely accounted for 2.7% of the variance in PPVT–4 (B=.425, p=.040).

Discussion: The pattern of interactive behaviors from the four domains evaluated by the DRI (PA, VOC, PHA, ATT), shows that mothers rarely used strategies for improving PA or PHA at T1. Instead they focused on supporting vocabulary comprehension (VOC) (e.g., pointing to and labeling pictures), and improving attention to the book reading task itself (ATT) (e.g., using character voices). Focusing on VOC strategies is likely the result of mothers adapting their interactions to the developmental level of their children. In terms of predicting language outcomes at T2, both MSEL NVIQ and CARS scores were the most significant contributors, which is typical for this population. It is notable that although VOC accounted for a relatively small proportion of the variance in PPVT-4 scores uniquely, it nevertheless remained significant even after adding nonverbal IQ and autism scores. This suggests that the early use of VOC strategies provided support for later vocabulary development in children with FXS. Activities designed to enhance attention to text (ATT) did not by themselves affect later language scores.

References/Citations:

