Title: Early Gestural and Lexical Abilities as Predictors of Cognitive and Vocabulary Abilities at 4 Years of Age in Children with Williams Syndrome

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Introduction: Previous researchers have found that early lexical and gestural abilities predict later vocabulary and intellectual abilities for both children in the general population and children with autism or Down syndrome (e.g., Ozcaliskan et al., 2015; Zampini & D’Odorico, 2011). The purpose of the present study was to determine the predictive validity of deictic gestures and expressive vocabulary (EV) abilities at age 24 months for intellectual and vocabulary abilities at age 4 years in children with Williams syndrome (WS). The effect of maternal education level on these abilities at age 4 years also was addressed.

Method: Participants were 31 children with WS (15 boys, 16 girls). Mean age at 24 months was 24.44 months (range = 23.59 – 24.97). Mean age at 4 years was 4.05 (range = 4.01 – 4.08). EV and deictic gestures at 24 months were determined from parental report on the MacArthur-Bates Communicative Development Inventories (CDI; Fenson et al., 2007). Intellectual abilities at age 4 years were determined with the Differential Abilities Scales-II (DAS-II; Elliott, 2007), and vocabulary abilities were determined with the Peabody Picture Vocabulary Test-4 (PPVT-4; Dunn & Dunn, 2007) for receptive vocabulary and the Expressive Vocabulary Test-2 (EVT-2; Williams, 2007) for expressive vocabulary.

Results: A series of multiple regression analyses was performed. Model 1 included maternal education (no bachelor degree vs. bachelor degree) as the only predictor. For Model 2, EV at 24 months of age was added as a predictor. For Model 3, deictic gestural abilities (2 = both point and show, 1 = point or show, 0 = neither) at 24 months was added. The dependent variables for intellectual abilities at age 4 years were DAS-II GCA (similar to IQ), Verbal standard score (SS), Nonverbal Reasoning SS, and Spatial SS. Vocabulary abilities at 4 years were measured by PPVT-4 SS and EVT-2 SS. Model 3 was the best predictor of DAS-II GCA, F(3,27)=16.84, p<.001, explaining 61% of the variance. Both EV and deictic gestures contributed significantly to the model (p<.01). Model 3 was the best predictor of Verbal SS, F(3,27)=14.33, p<.001, explaining 57% of the variance. Both EV and deictic gestures contributed significantly to the model (p<.01). Model 3 was the best predictor of Nonverbal Reasoning SS, F(3,27)=11.52, p<.001, explaining 51% of the variance. Both EV and deictic gestures contributed significantly to the model (p<.01 and p<.05 respectively). Model 3 provided the only significant fit to the data for Spatial SS, F(3,27)=6.16, p<.01, explaining 34% of the variance, with only deictic gestures contributing significantly to the model (p<.01). With regard to vocabulary abilities, Model 3 provided the best fit to the data for PPVT-4 SS F(3,27)=20.89, p<.001, explaining 66% of the variance. All three predictors contributed significantly to the model (p<.01). Model 3 provided the best fit to the data for EVT-2 SS, F(3,27)=15.74, p<.001, explaining 59% of the variance, with both EV and deictic gestures being significant predictors (p<.001 and p<.01, respectively).

Discussion: EV size and deictic gestures at age 24 months significantly predict intellectual and vocabulary abilities of children with WS at age 4 years. Maternal level of education accounted for significant variability in receptive vocabulary ability. Although very few children with WS acquire deictic gestures before they begin to talk – unlike children in the general population or children with other developmental disabilities (Mervis & Bertrand, 1997) – deictic gestural abilities make important contributions to later language and intellectual development by children with WS. Implications for early intervention will be discussed.

References/Citations: