Title: Concurrent Validity of the MacArthur-Bates Communicative Development Inventory-III for 60-month-olds with Williams Syndrome

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Introduction: The MacArthur-Bates Communicative Development Inventory – Level III (CDI-III; Fenson et al., 2007) is a parent-report measure of children’s lexical and grammatical skills. Previous studies have addressed the concurrent validity of the CDI-III for 36-month-olds in the general population, children born preterm, children with recurrent otitis media, and children with language impairment. These studies have found moderate to strong correlations between the CDI-III measures and measures of language and intellectual abilities (e.g., Fenson et al., 2007). However, the concurrent validity of the CDI-III for children with genetic syndromes has not been considered. In this study we addressed the concurrent validity of the CDI-III for 60-month-olds with Williams syndrome (WS) in relation to both naturalistic measures of language production and standardized measures of intellectual and language abilities.

Methods: Participants were 48 60-month-olds with genetically-confirmed classic WS deletions (23 girls, 25 boys). From parental report on the CDI-III we determined expressive vocabulary size (EV; maximum = 100 words) and the number of sentence pairs for which the parent selected the more complex sentence (sentence complexity: SC; maximum = 12). Children completed a 30-minute play session with a parent. Play sessions were transcribed using Systematic Analysis of Language Transcripts (SALT; Miller & Iglesias, 2016) which determined the number of different words (NDW) produced spontaneously (not in imitation) by the child and the child’s mean length of utterance in morphemes (MLU). Children also completed the Differential Ability Scales-II (DAS-II; Elliott, 2007), which provided measures of Verbal, Nonverbal Reasoning, and Spatial ability; the Peabody Picture Vocabulary Test-4 (PPVT-4; Dunn & Dunn, 2007), a measure of receptive vocabulary; and the Expressive Vocabulary Test-2 (EVT-2; Williams, 2007), a measure of expressive vocabulary. 23 of the children also completed the Clinical Evaluation of Language Fundamentals Preschool-2 (CELF-Pre2; Wiig et al., 2004), from which we determined the Expressive Language Index (ELI) and the Language Structure Index (LSI). For all standardized assessments, mean standard score (SS) = 100 and SD = 15 for the general population.

Results: Despite the very narrow age range, there were large individual differences in both lexical and grammatical abilities: Mean CDI-III EV was 57.65 words (SD = 28.36, range = 0 - 99) and mean CDI-III SC was 5.69 (SD = 4.37, range = 0 – 12). The correlation between CDI-III EV and SC was very strong \( r = .86, p < .001 \). Correlations of CDI-III EV and CDI-III SC with play session measures and standardized language measures were strong, with a range from \( r = .62 \) between CDI-III EV and CELF-Pre2 LSI to \( r = .88 \) between CDI-III SC and CELF-Pre2 ELI (all \( p \leq .002 \)). Correlations of CDI-III EV and CDI-III SC with intellectual abilities as measured by the DAS-II were moderate to strong, with a range from \( r = .46 \) for CDI-III EV and DAS-II Spatial SS to \( r = .74 \) for CDI-III EV and DAS-II Verbal SS (all \( p \leq .001 \)).

Discussion: The concurrent correlations of the CDI-III EV and CDI-III SC with naturalistic measures of language and standardized measures of language and intellectual abilities were at least strong as those previously reported for typically developing children. These findings provide very strong evidence of the concurrent validity of the CDI-III as a measure of lexical and grammatical abilities for 60-month-olds with WS. Further studies addressing the concurrent validity of the CDI-III for children with WS of other ages and for children who have other genetic syndromes are warranted.
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