Title: Predictors of Emerging Word Combinations by Toddlers who Participated in Parent-Coached Language Interventions

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Introduction: Much of what we know about language development is based on longitudinal studies of children with typical development (Bates et al., 1988; Bloom, 1970; Brown, 1973). In typically developing children, the transition from single to early-word combinations occurs at around two years of age when children demonstrate a vocabulary of about 50 words. However, little is known about the shift from single to two-word utterances in children with expressive communication delays who are learning to use alternative modalities such as visual-graphic symbols. Without a foundation of comprehension skills, children may struggle to increase expressive language skills, even when given access to an alternative modality of communication (Romski & Sevcik, 1993; Romski & Sevcik, 1997; Sevcik & Romski, 2005). The purpose of this study is to examine whether the baseline comprehension skills and target vocabulary acquisition of 113 toddlers who participated parent-coached language interventions predict emerging vocabulary combinations. Specifically, we asked a.) whether target vocabulary learned during intervention directly predicts emerging word combinations and b.) whether receptive language indirectly predicts word combinations through target vocabulary as a mediating variable.

Method: The data for the analyses in this study were drawn from two intervention studies by Romski and colleagues (Romski et al., 2010, 2017). 113 parent-toddler dyads participated in parent-implemented language interventions. Children either participated in an Augmentative Alternative Communication group (access to a speech-generating device) or a spoken communication group (no access to a speech-generating device). Toddlers ranged between 24-36 months and demonstrated significant developmental and expressive language delay (less than ten spoken intelligible words). Receptive and expressive language skills were assessed using the Mullen Scales of Early Learning (MSEL), the Vineland Adaptive Behavior Scales (VABS), The MacArthur-Bates Communicative Development Inventory (MCDI), and Sequenced Inventory of Communication Development (SICD). Before intervention, toddlers were assigned an individualized list of target vocabulary words that they did not produce or understand and were appropriate to the intervention routines.

Results: Analysis 1: A one-factor Confirmatory Factor Analysis (CFA) was implemented to examine whether scores by the toddlers on subtests from the VABS, MCDI, SICD, and MCDI predicted latent receptive language factor.
Analysis 2: Using the bootstrapping method (Hayes, 2010), a mediation model was implemented to assess whether the indirect effect of the receptive language latent variable (tested in analysis 1) on vocabulary combinations were mediated by target vocabulary acquired by toddlers at the end of language intervention.

The one-factor receptive language model proposed in Analysis 1 demonstrated good fit ($\chi^2(2) = 289.81$, RMSEA = .05, CFI = .99, $p = .29$). In addition, all four receptive language subtests demonstrated significant standardized loadings ($p < .05$). Results for Analysis 2 indicated that receptive language at baseline significantly predicted target vocabulary acquisition at the end of language intervention ($\beta = .47$, $SE = .17$, $\delta^* = .32$, $p = .003$) and supported the results of Barker, Romski, Sevcik, Adamson, Smith, & Bakeman (2017). Target vocabulary size at the end of 24 weeks of language intervention predicted emerging vocabulary combinations ($\beta = .11$, $SE = .04$, $\delta^* = .33$, $p < .001$). The indirect effect tested using bootstrapped standard errors was also significant ($\beta = .05$, 95% CI = .03, .203 $\delta^* = .12$), which supports the hypothesis that baseline receptive language skills indirectly predict emerging vocabulary combinations through the mediation of target vocabulary use at the end of language intervention.

Discussion: The results from this study suggest that receptive language directly predicts vocabulary acquisition and indirectly predicts two-word combinations in toddlers who participated in a parent-implemented language intervention. The trajectory leading to early word combinations for children with severe developmental and language delays can look similar to those of typically developing children: receptive language is foundational to early word learning and word learning is foundational to early word combinations.

References/Citations: