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Brief Report

Developmental changes in maternal education and minimal exposure effects on vocabulary in English- and Spanish-learning toddlers

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ABSTRACT

The current research follows up on two previous findings: that children with minimal dual-language exposure have smaller receptive vocabularies at 16 months of age and that maternal education is a predictor of vocabulary when the dominant language is English but not when it is Spanish. The current study extends this research to 22-month-olds to assess the developmental effects of minimal exposure and maternal education on direct and parent-report measures of vocabulary size. The effects of minimal exposure on vocabulary size are no longer present at 22 months of age, whereas maternal education effects remain but only for English speakers.

Introduction

The current research follows up on two previous findings. First, children with minimal dual-language exposure have smaller receptive vocabularies at 16 months of age in the language of greatest

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exposure (i.e., dominant language) relative to their monolingual peers. Second, maternal education is a predictor of vocabulary when the dominant language is English but not when it is Spanish (DeAnda, Arias-Trejo, Poulin-Dubois, Zesiger, & Friend, 2016). We extend this research to 22-month-olds to determine whether these patterns hold 6 months later using both direct and parent-report measures of vocabulary size. The overarching aim of this study was to contrast the effects of maternal education and minimal dual-language exposure on lexical development in English learners in the United States and Spanish learners in the United States and Mexico.

Socioeconomic status and maternal education

Socioeconomic status (SES) reflects a range of factors, including education, income, and occupational prestige. In some studies of early language, researchers employ a broad measure of SES incorporating these factors. In other studies, researchers employ maternal education as a proxy for SES; maternal education is the component of SES that is most closely related to parenting (Hoff, Laursen, & Tardif, 2002) and is correlated with vocabulary development during early childhood (Dollaghan et al., 1999; Hoff, 2003). Furthermore, in one study of Venezuelan mothers, maternal education, controlling for childhood SES and maternal age, accounted for 30% of the variance in maternal communication (LeVine, LeVine, Schnell-Anzola, Rowe, & Dexter, 2012).

In English monolinguals, children from higher SES families have larger vocabularies on average than their lower SES peers by 18 months of age, a gap that widens by 24 months (Fernald, Marchman, & Weisleder, 2013) consistent with findings in language, literacy, and academic achievement (e.g., Hoff, 2013; Oller & Eilers, 2002). In English, the relation between SES and early language is mediated by maternal input (Hart & Risley, 1995; Hoff, 2003; Vernon-Feagans et al., 2008); SES predicts quantity and quality of maternal input, which correlates with early language.

The effects of SES and maternal education on vocabulary in Spanish-speaking children are less clear. One early study took place in the Mexican city of Cuernavaca during the early 1980s when female educational opportunities had been recently expanded (Richman, Miller, & LeVine, 1992). Maternal education was predictive of maternal responsiveness in mothers who had attained between 1 and 9 years of schooling. Specifically, more educated mothers were more likely to respond verbally to looks and vocalizations from their 10- and 15-month-old infants than were less educated mothers. In a follow-up study, LeVine et al. (2012) assessed a subset of these children when they were roughly $2^1/_2$ years old on four abilities: pointing to named parts of their bodies, identifying common objects (e.g., cup), following simple commands, and identifying the function of common objects (e.g., drink). These abilities were positively correlated with maternal education and with maternal responsiveness at 15 months of age.

In more recent findings, maternal education did not explain vocabulary growth in comprehension or production from 13 to 30 months of age on the Inventarios de Habilidades Comunicativas (IDHC; Jackson-Maldonado et al., 2003), a parent-report measure of Spanish vocabulary acquisition. The IDHC was normed on Spanish-learning children in Mexico whose mothers' education ranged, in large part, from no high school to college/university education. Similarly, DeAnda, Arias-Trejo et al. (2016) found that whereas maternal education was related to receptive vocabulary size in English-learning toddlers at 16 months of age, this was not the case for same-age Spanish-learning peers. Finally, Hurtado, Marchman, and Fernald (2008) found no effect of SES on expressive vocabulary, word processing, or maternal input in Spanish-learning toddlers at 18 and 24 months but did find an effect of maternal input on vocabulary at 24 months. In Dominican, Mexican, and African American children, Tamis-LeMonda, Song, Leavell, Kahana-Kalman, and Yoshikawa (2012) found an effect of maternal language at 24 months but found no effect of maternal education. Nevertheless, in another study, quantity of child-directed speech at 19 months did predict vocabulary and word processing 6 months later in Spanish-learning children (Weisleder & Fernald, 2013). Whereas the relation between maternal input and early language appears to be similar across studies and languages, the relation between maternal education and early vocabulary has not been found consistently.

One concern is that design considerations may contribute to this inconsistency in findings. For example, although a small sample size and low SES may have had limited detection of effects in Hurtado et al. (2008), the Jackson-Maldonado et al. (2003) study employing a larger, more