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Growth in toddlers' Spanish, English, and conceptual vocabulary knowledge

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ABSTRACT

This longitudinal study modeled growth rates, from ages 24 to 36 months, in English, Spanish, and conceptual (i.e., combination of English and Spanish vocabulary items in terms of known concepts) productive vocabulary among 36 children from low-income homes. Individual growth modeling was employed using scores from the MacArthur–Bates Communicative Development Inventory (CDI; Fenson et al., 2007) and the MacArthur Inventarios del Desarrollo de Habilidades Comunicativas (IDHC; Jackson-Maldonado et al., 2003) which were completed by parents every three months. Results demonstrate that students started out below national norms for monolinguals in English and Spanish vocabulary and their rates of growth did not allow them to reach age-appropriate levels even when applied beyond the age range for which the parent reports were designed. However, shifts toward more English use were documented. Additionally, when conceptual vocabulary growth was considered, the magnitude of the vocabulary gap relative to national norms was not as pronounced, underscoring the need attend to both languages. Theoretical, policy, and practical implications concerning dual language learning prior to formal school entry are discussed.

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Children from immigrant families, the majority of whom are born into Spanish-speaking, low-income homes in the U.S., comprise nearly one-quarter of all U.S. children (Fortuny, Capps, Simms, & Chaudry, 2009; Mather, 2009). Furthermore, children between the ages of 0 and 5 constitute the largest (40%) and fastest growing segment of this population (Fortuny et al., 2009; Passel, Cohn, & López, 2011). Converging evidence indicates that children from homes in which a language other than English is spoken and children from low-income homes are at greater risk for school failure than monolingual English speakers (August & Shanahan, 2006; National Institute of Child Health & Human Development, 2000; Snow, Burns, & Griffin, 1998). Preschool programs, such as the nationally funded Early Head Start (EHS) and Head Start (HS) programs, were specifically designed to promote school readiness for disadvantaged children under age 5. Over the years, the percentage of Latino children from Spanish-speaking homes in EHS and HS has grown substantially. Currently, Latino children constitute 37% of the EHS and HS total enrollment (U.S. Department of Health and Human Services, Administration for Children and Families, Head Start Bureau, 2011). The education of the young Latino population indeed represents an urgent educational demographic imperative (García & Frede, 2010; Garcia & Jensen, 2009; National Task Force on Early Childhood Education for Hispanics, 2007).

Children from Spanish-speaking Latino homes in the U.S. tend to be exposed, at least to some extent, to both Spanish and English. For example, even among immigrant families, 60% of Latino children have some level of English proficiency (Hernandez, 2006). At the same time, among U.S.-born Latino families, most children are exposed by their parents to Spanish (Hernandez, 2010). Thus, researchers have called for the need to monitor development in both languages as the child's vocabulary is likely to be distributed across the two languages (Bedore, Peña, García, & Cortez, 2005; Pearson, Fernández, & Oller, 1995). Although bilingualism is not, in and of itself, a risk factor for academic difficulties (De Houwer, 1999; Snow, 1992), in the U.S. context, a major concern that must be contended with is that Latino children are now the largest single group of poor children (López & Velasco, 2011) and poverty *is* a well-known risk factor for developmental problems (Brooks-Gunn & Duncan, 1997), including vocabulary development (Hart & Risley, 1995). Indeed, numerous studies report that Latino children from low-income homes tend to evidence low vocabulary levels, even prior to formal school entry (August & Shanahan, 2006); the strong and well-known relationship between children's vocabulary knowledge and their overall academic success (Anderson & Nagy,

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1991) demands attention to young Latino children's—particularly those from low-income homes—vocabulary development during the toddler years. Yet, the knowledge base concerning the patterns of vocabulary development for this growing population of learners, in the process of acquiring both Spanish and English, remains scant.

One of the most challenging aspects of understanding young bilingual learners' vocabulary development is that few tools are specifically designed for this population and age group. The MacArthur–Bates Communicative Development Inventory (English CDI; Fenson et al., 2007) and the MacArthur Inventarios del Desarrollo de Habilidades Comunicativas (Spanish IDHC; Jackson-Maldonado et al., 2003) parent-report measures of children's vocabulary, represent one exception. The English CDI and Spanish IDHC toddler forms (for use with children aged 16–30 months) follow a word checklist format that includes 680 semantically grouped words (i.e., household items, outside things, toys). The Spanish IDHC is not a direct translation of the original English CDI as the Spanish version reflects relevant linguistic and cultural differences. However, both vocabulary forms incorporate the words young children typically learn first, resulting in considerable overlap (i.e., equivalent translation items such as the English word *table* and the Spanish equivalent *mesa*) between the words on the English CDI and those on the analogous Spanish IDHC form. Parents indicate whether or not their child spontaneously produces the listed words and a raw score is derived by totaling the number of words the parent reported. Of key interest, if we are to gain a more nuanced understanding of young bilingual children's vocabulary learning is that, to represent their overall vocabulary knowledge in terms of known concepts, a Total Conceptual (TC) vocabulary score (Marchman & Martinez-Sussmann, 2002; Pearson & Fernández, 1994; Pearson, Fernández, & Oller, 1993) can be derived by simply summing the English CDI and Spanish IDHC scores and then subtracting equivalent translation items. However, there are limitations of these tools for use with children learning both English and Spanish, including: (a) the norms for the English CDI and Spanish IDHC are based on monolingual English and monolingual Spanish speakers, respectively, (b) there are no norms for the TC vocabulary score (to date, the Spanish IDHC norms have been applied to interpret this score), and (c) the norming population included children only up to age 30 months. Despite these limitations, previous work lends support to the utility and validity of this tool for young monolingual (Vagh, Pan, & Mancilla-Martinez, 2009) and Spanish–English bilingual (Mancilla-Martinez, Pan, & Vagh, 2011) children between the ages of 24–36 months from low-income homes. The English and Spanish parent report forms thus represent a valid mechanism by which to longitudinally track the developing vocabularies of Spanish–English bilingual toddlers during a critical developmental period.

Given the heterogeneity among children from Spanish-speaking homes, the process of understanding this group's vocabulary development will be a cumulative one, requiring work with samples drawn from different countries of origin residing in varying geographic locations throughout the United States (Keels & Raver, 2009). In this longitudinal study, we utilize the English CDI and Spanish IDHC to document the English, Spanish, and Total Conceptual vocabulary development of one group of young children aged 24–36 months from Spanish–English bilingual, low-income homes residing in the New England area of the United States; a region that has experienced rapid growth in the Latino population since the 2000s (Fry, 2008). To our knowledge, this is the first study to longitudinally document patterns of vocabulary growth in each language and also in terms of known concepts among a low-income sample of Spanish–English bilingual toddlers. This study is, thus, uniquely positioned to provide the research-, policy- and practice-based communities with insight into the way in which toddlers in the U.S. from Spanish-speaking homes who are also exposed to English develop their dual vocabulary base prior to formal school entry. Such knowledge can help inform theory about the process of vocabulary development in two languages while simultaneously informing policy and practice about the contexts that might maximize Spanish–English bilingual toddlers' opportunities to further develop their vocabulary base.

1. Vocabulary development in young bilinguals

Language learning appears to unfold naturally and effortlessly, an intriguing realization that remains a mystery (Kuhl, 2004). There is wide consensus, however, that language input is necessary for language learning (Hart & Risley, 1995; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Kuhl, 2004; Locke, 1993). But for children who are exposed to more than one language, the mechanisms underlying *dual* language learning are all the more complex. Unlike the monolingual child faced with the challenging task of mapping *one* specific sound sequence to a specific referent, the bilingual child faces the task of ultimately mapping *two* distinct sound sequences to the same referent, a higher cognitive processing and attentional load. Historically, there has been a dichotomized view of dual language learning, namely unitary and differentiated language systems (Genesee, 1989; Heredia & Brown, 2004). The revised hierarchical model (RHM; Sunderman & Kroll, 2006) takes a developmental perspective and marries these opposing views. Specifically, the RHM posits that, as proposed by the differentiated view of language, bilinguals indeed represent their two languages in separate lexicons, but in line with the unitary view, they do so with one conceptual (language-free) system subserving both languages. This conceptualization of second language learning is compatible with Cummins' (1979, 1991) well-known linguistic interdependence hypothesis wherein the two languages are posited to be interdependent, resting on a mutual central processing system from which both languages operate (i.e., a common underlying proficiency or common knowledge base). Specifically, proficiency in one language is thought to facilitate proficiency in another. For example, if a child learns the word *upset*, s/he has a general conceptual understanding of the word, facilitating the acquisition of the Spanish equivalent (*enojado*). Indeed, in contrast to early work on bilingualism that suggested bilinguals are at a linguistic or cognitive disadvantage (Diaz, 1983), a robust body of research suggests that there are cognitive benefits associated with bilingualism as, in line with Cummins' interdependence hypothesis, having one language actually facilitates the acquisition of another given the metalinguistic ability that develops as a result of negotiating two languages (Bialystok, 1988, 2005; Diaz, 1983, 1985). But, given that bilinguals receive input in two languages while monolinguals do so in only one—fundamentally different language environments—, there is no reason to expect *equal* proficiency in both languages among children acquiring two languages (Bialystok, 2001; Grosjean, 1982, 1989, 2008; Romaine, 1999). Thus, reports of young bilingual children's lower vocabularies relative to their monolingual peers (Hammer, Lawrence, & Miccio, 2008; Junker & Stockman, 2002; Patterson, 2002; Vermeer, 2001) should not be unexpected. The more pertinent point is that, when both of their languages are considered in tandem (i.e., conceptual), the vocabulary developmental course appears to be comparable to that of their monolingual counterparts (Patterson, 1998; Pearson & Fernández, 1994).

Pearson et al. (1993) and Pearson and Fernández (1994) proposed the adaption of the English CDI and Spanish IDHC vocabulary measures so as to generate a TC vocabulary score. As noted earlier, the TC score is derived by simply summing the English CDI and Spanish IDHC scores and then subtracting equivalent translation