

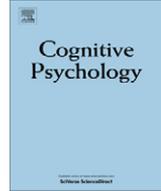


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Disentangling the effects of cognitive development and linguistic expertise: A longitudinal study of the acquisition of English in internationally-adopted children

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ABSTRACT

Early language development is characterized by predictable changes in the words children produce and the complexity of their utterances. In infants, these changes could reflect increasing linguistic expertise or cognitive maturation and development. To disentangle these factors, we compared the acquisition of English in internationally-adopted preschoolers and internationally-adopted infants. Parental reports and speech samples were collected for 1 year. Both groups showed the qualitative shifts that characterize first-language acquisition. Initially, they produced single-word utterances consisting mostly of nouns and social words. The appearance of verbs, adjectives and multiword utterances was predicted by vocabulary size in both groups. Preschoolers did learn some words at an earlier stage than infants, specifically words referring to the past or future and adjectives describing behavior and internal states. These findings suggest that cognitive development plays little role in the shift from referential terms to predicates but may constrain children's ability to learn some abstract words.

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1. Introduction

Early language production can be characterized as a series of roadblocks that are gradually removed. Most infants use single-word utterances for many months before they begin combining words (Bloom, 1973; Nice, 1925). Children's first words are largely limited to social routines and labels for the people and things around them. Verbs, adjectives and closed-class words only become common at larger vocabulary sizes (Bates et al., 1994; Doran, 1907; Gentner, 1982; McCarthy, 1930). Two central

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questions in language acquisition are: What accounts for these early limitations, and how are they overcome (Bloom, 1973; Cromer, 1974; Gleitman, 1981; Lenneberg, 1967)? Specifically, are the initial stages present because the child is cognitively or perceptually immature, or do they represent necessary steps in acquiring the target language? Are new linguistic abilities partially due to broad changes in the cognitive abilities of the learner, or are they solely attributable to the child's growing knowledge of the language itself? These questions are difficult to answer because cognitive development and language acquisition are confounded in typically-developing children. Young infants are cognitively immature and limited in their linguistic knowledge, while older children are more sophisticated in both respects.

When confronted with confounds like this, developmental psychologists often turn to special populations in which the variables of interest can be disentangled. Much of what we know about language development comes from studies of atypical populations (see e.g., Bellugi, Marks, Bihrlé, & Sabo, 1988; Cromer, 1974; Curtiss, 1989; Goldin-Meadow & Feldman, 1977; Landau & Gleitman, 1985; Senghas, 2003). These natural experiments allow us to explore the effects of factors that are impossible or unethical to manipulate.

International adoption is one such natural experiment, creating the opportunity to disentangle the effects of linguistic expertise and cognitive maturation. Between 2000 and 2009, almost 200,000 internationally-adopted children entered the US (US Department of State, 2011). While most are infants or toddlers, thousands of older children are also adopted. Many of these children are well within the critical or sensitive period for learning language (Newport, 1990). These older children appear to rapidly lose their birth language (Glennen, 2002; Gindis, 2005) and become fluent speakers of their adoptive language (Hyltenstam, Bylund, Abrahamsson, & Park, 2009; Pallier et al., 2003). But we know little about the path they take to get there. While a number of researchers have studied language development in children adopted as infants or toddlers (see e.g., Gauthier & Genesee, 2011; Glennen & Masters, 2002; Hwa-Froelich, 2009; Roberts et al., 2005; Tan & Yang, 2005), there is less work on acquisition in children adopted after 30 months (but see Glennen, 2009). In addition, most of the prior research has focused on comparing the performance of adopted children with age-matched peers (or norms) to identify possible deficits (see Scott, Roberts, & Glennen, 2011 for a meta-analysis). To date, only one study has explored the pathway of early language learning in older adoptees (Snedeker, Geren, & Shafto, 2007).

The learning problem faced by internationally-adopted preschoolers is broadly similar to that of infants learning their first language: they are exposed to child-directed speech in the context of daily routines; they must learn the new language to communicate with their families; unlike most second language learners, they do not have access to written texts or bilingual informants; and they lack many of the metalinguistic skills that are available to school-aged children and adults (Gombert, 1992). However, these preschoolers are more cognitively and physically mature than their infant counterparts and have already started to learn one language. Thus international adoption could provide a way to explore the role that cognitive development and maturation play in shaping the course of first language acquisition, by allowing us to see how acquisition proceeds when these roadblocks have been removed. Such a tool would be useful for distinguishing between two broad classes of hypotheses about qualitative changes during language acquisition:

- (1) **Developmental Hypotheses:** Theories of this kind attribute the order of acquisition or the emergence of new abilities to changes in the learner that are independent of her experience with a given language. Immaturity constrains language acquisition, limiting the kinds of words that a child can learn, the kinds of utterances she can produce or the kinds of representations she can create. When these limitations are removed, by biological maturation or cognitive development, new linguistic abilities can emerge.
- (2) **Contingent-Acquisition Hypotheses:** These theories attribute the order of acquisition to the interdependence of different linguistic representations, processes, or learning algorithms. Critically, the emergence of new abilities is driven by the child's growing knowledge of the language. If knowledge of form A is necessary for acquiring form B, then the acquisition of B will have to await the acquisition of A.¹

¹ The contingent-acquisition hypotheses under consideration make the weaker claim that one type of knowledge is needed for efficient acquisition or utilization of another type. This is desirable since the generalizations under consideration are strong but violable. For example, children do learn some verbs early on (Bates, Dale, & Thal, 1995).

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