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## Cognitive Development



# Beyond early linguistic competence: Development of children's ability to interpret adjectives flexibly



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### ABSTRACT

We investigated the circumstances in which 3- to 5-year-old children can and cannot interpret adjectives flexibly. In Experiment 1, children were required to interpret *big* and *little* both in reference to a basic level kind (e.g., “This is a big marble”) and in reference to a superordinate kind (e.g., “This is a little toy”). Experiment 2 examined 3-year-olds’ flexible interpretation of *big* and *little* with respect to a medium-sized stimulus that was alternately compared with a smaller stimulus and a larger stimulus (e.g., “Which one of these two circles is the big one?”). Even the youngest children switched between interpretations when the switch was accompanied by a change in the stimulus display. When the stimulus display remained constant, however, younger children typically perseverated on a single interpretation. Results replicate evidence of the roots of flexible adjective interpretation but also show protracted development of the ability to coordinate two incompatible interpretations of a single situation.

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Understanding adjectives such as *big* and *little* in an adult-like manner requires an appreciation of the multiple ways in which adjectives can be interpreted, as well as the ability to switch flexibly

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between different interpretations (Ebeling & Gelman, 1994). One can, for example, judge a hat to be big for a hat, but at the same time recognize that it is small compared to another hat. Ebeling and Gelman (1988, 1994) discussed flexible adjective interpretation in terms of sensitivity to context. They noted, for example, that *normative* contexts require comparison with a stored mental representation of a given kind, whereas *perceptual* contexts require comparison with a physically present object. In a series of studies, they presented children with the same objects in different contexts. For example, in a typical test, children were shown a normatively small hat and asked whether it was big or little. They were then shown the same small hat alongside a tiny hat and asked again whether the first hat was big or little. Even 2-year-olds generally called the same hat first “little” (normatively) and then “big” (perceptually), which Ebeling and Gelman (1994) interpreted as evidence that young children can switch flexibly from one context of interpretation to another (see also Sera & Smith, 1987).

This evidence of flexibility is somewhat surprising in light of research indicating that young children often have difficulty switching between different perspectives on a single stimulus. They perseverate in representing stimuli in a particular way even when it is no longer appropriate to do so. In tasks assessing understanding of appearance and reality, for example, children are shown a deceptive object such as a sponge rock and asked about its appearance (“What does it look like?”) and its true nature or function (“What is it really?”). Three-year-olds are much more likely than 5-year-olds to give the same answer to both questions (Flavell, Green, & Flavell, 1986). Similarly, in the dimensional change card sort (DCCS), children are asked to sort a series of pictures (e.g., red rabbits and blue cars) first according to one dimension (e.g., color) and then according to another (e.g., shape). Regardless of which dimension is presented first, 3-year-olds typically continue to sort the cards by that dimension despite being told the new rules on every trial (Zelazo, Müller, Frye, & Marcovitch, 2003). Inflexibility has also been observed in preschoolers’ understanding of false beliefs (see Wellman, Cross, & Watson, 2001, for a meta-analysis), reasoning about physical causality (Das Gupta & Bryant, 1989), moral reasoning (Zelazo, Helwig, & Lau, 1996b), reasoning about external representations (DeLoache, Pierroutsakos, & Troseth, 1996), inferring word meanings (Deák, 2000), and generating multiple labels for a single object (Doherty & Perner, 1998; Markman, 1989; but see Deák & Maratsos, 1998). Findings like these are consistent with traditional characterizations of young children as relatively inflexible (DeLoache, 1987; Piaget, 1954; Piaget & Inhelder, 1959; Zelazo, Frye, & Rapus, 1996a). In each case, younger preschoolers seem to have difficulty switching between conflicting representations, and there are age-related increases in flexibility that continue beyond the preschool years. Even young school-aged children, for example, rigidly focus on the content of what a speaker says (versus the tone of the speaker’s voice) when asked to infer the speaker’s emotion, despite being instructed to attend to the tone (Morton, Trehub, & Zelazo, 2003).

There is thus a discrepancy, with young children appearing to exhibit more flexibility when understanding and using adjectives than they do when reasoning in many other situations. It is possible that children demonstrate flexibility earlier in the context of adjective interpretation than in other contexts (e.g., in the DCCS), but it is also possible that children’s flexible adjective interpretation may be scaffolded by aspects of the circumstances in which it has been assessed. The experiments presented here were designed to determine more precisely the circumstances in which children at different ages interpret adjectives flexibly. Characterization of these circumstances may inform our understanding not only of the development of children’s flexible interpretation of adjectives, but also of the way in which this development interacts with other aspects of cognitive development, such as children’s developing attentional control and cognitive flexibility.

How might one reconcile the early flexibility noted by Ebeling and Gelman (1994) with demonstrations of rigidity in young children’s reasoning? Work by Deák (2000), Deák, Ray, and Pick (2002) points to one possibility. Deák (2000) examined 3–6-year-olds’ use of different predicates (“looks like a . . .,” “is made of . . .,” or “has a . . .”) to infer the meanings of novel words. He found that 3-year-olds typically used the first predicate appropriately to infer the meaning of the first novel word in a series but then proceeded to use that same predicate to infer the meanings of subsequent words. In contrast, older children used the most recent predicate as a cue to constrain their inference about word meaning. Deák (2000) suggested that age-related changes in the flexible use of predicate cues can be understood in part in terms of age-related increases in sensitivity to inter-trial differences. That is, younger children fail to attend to the cues (i.e., the predicate cues) that indicate that the inductive

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