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## The relations between children's communicative perspective-taking and executive functioning

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### ABSTRACT

Two experiments investigated children's communicative perspective-taking ability. In Experiment 1, 4- to 5-year-old children were tested on two referential communication tasks, as well as on measures of inhibitory control, working memory, and cognitive flexibility. Results document children's emergent use of the perspective of their speaking partner to guide their communicative behaviors in both a production and comprehension task. In Experiment 2, 3- to 4-year-old children used a speaker's perspective to guide their interpretation of instructions. In both experiments, egocentric interpretations of speaker requests were negatively correlated with children's inhibitory control skills. Results of these studies demonstrate that young children can differentiate between information that is accessible to the speaker versus privileged knowledge, and use this information to guide their communicative behaviors. Furthermore, the results suggest that children's inhibitory control skills allow them to inhibit their own perspective, enabling them to make use of their communicative partner's perspective.

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### 1. Introduction

Young children acquire their native language at a striking pace, a remarkable feat considering the complexity of the language learning task. Not only must children learn the speech sounds, words, and grammar of their language, they must also acquire pragmatic competence—an understanding of how language is used for social and functional purposes. Pragmatic competence is often

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reflected in the *referential* aspects of communication, namely how a speaker uses words and phrases to denote things in the world. One key aspect of successful referential communication is the ability to identify information that is or is not shared with a conversational partner, such as whether a partner knows facts  $x$  and  $y$ , or whether the partner can see object  $z$ . The ability to track shared knowledge or “common ground” (Clark, 1992) requires an appreciation of the social and situational context as well as the ability to adopt another person’s perspective. Consider, for example, a situation in which a speaker is directing a listener to pick up a ball from a toy box which contains a number of balls. In this situation, the phrase “Get the ball” would be ambiguous to the listener. Thus, a skilled communicator would provide additional information that would clarify the intended referent (e.g., “Get the *red* ball.”). In these studies, we examined young children’s sensitivity to another’s perspective when giving and receiving instructions and investigated the cognitive skills that may predict children’s tendency to use the perspective of another to guide their communicative behaviors.

According to Piaget, children younger than 7 or 8 years of age are incapable of tailoring their communication to another’s knowledge state and are essentially “talking to themselves,” (Piaget, 1959, p. 38). In support of this notion, research has demonstrated that children younger than 6 or 7 years do not successfully take into account a listener’s perspective in referential communication tasks (e.g., Deutsch & Pechman, 1982; Glucksberg & Krauss, 1967; Lloyd, Mann, & Peers, 1998; Sonnenschein & Whitehurst, 1984). This “egocentrism” can be seen both in children’s production of ambiguous statements and in their comprehension of instructions. For example, Deutsch and Pechmann (1982) demonstrated that even by 6 years of age, only 50% of children tested provided adequate verbal descriptions to describe objects to a listener (e.g., asking for the “red one” when several red objects were presented). Similarly, a recent study by Epley, Morewedge, and Keysar (2004) demonstrated that 6-year-olds initially interpret communicative situations from their own perspective, rather than from the speaker’s perspective, and furthermore, tend not to correct such interpretations at later processing stages.

This tendency to display egocentric behavior in communicative situations is puzzling given that research on theory of mind (i.e., the ability to recognize and reason about other people’s mental states; Premack & Woodruff, 1978; Wimmer & Perner, 1983) demonstrates that by 4 years of age, children understand that another’s knowledge state, including perspective, can differ from their own (e.g., Astington & Gopnik, 1991; Perner, Leekam, & Wimmer, 1987). For example, Perner and Leekam (1986) demonstrated that older 3-year-olds tracked the knowledge state of another person and then updated this person regarding information he or she had missed seeing about the novel action of a toy. Similarly, research on early word-learning highlights children’s impressive ability to take the situational context of another person into consideration when attaching a label to a referent object (Baldwin et al., 1996; Tomasello & Akhtar, 1995). For example, Akhtar, Carpenter, and Tomasello (1996) demonstrated that 2-year-old children use the speaker’s perspective to attach a label to a novel object. That is, children mapped a novel label to an object that was novel to the speaker, but not novel to the children themselves.

Given the impressive perspective-taking abilities that young children exhibit in theory of mind tasks and word-learning contexts, why are they not able to make use of this information in referential communication tasks? One possible explanation is that the cognitive burden involved in successfully considering another’s perspective when engaging in communicative behaviors is too great for young children (Nadig & Sedivy, 2002; O’Neill and Topolevec, 2001). Successful referential communication requires an individual to gather together different pieces of information (e.g., contextual background information, the perspective of a speaking partner), hold this information in memory, inhibit conflicting information such as one’s own perspective, and then generate a communicative behavior. It may be that the coordination of all of these tasks imposes too great a load on young children’s cognitive processes, leading them to default to egocentric communications. If this is the case, then two specific predictions about children’s behavior in communicative tasks can be made. First, one would expect that when cognitive demands are reduced in a communicative context, children would demonstrate more successful use of another’s perspective. Second, one would expect that certain cognitive skills such as memory capacity and inhibitory control would be related to children’s ability to use another’s perspective in a referential communication task.

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