



## Brief report

## A Piagetian approach to infant referential behaviors

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## ABSTRACT

Near the end of the first year of life, infants begin producing referential behaviors that in adults indicate joint attention, or coordinating shared attention to an object with another person. These behaviors have been interpreted in the social cognitive literature as an indication that infants realize they are sharing attention to an object with another person. In this paper, we address theory and research on infant referential behaviors described as joint attention and offer an alternative explanation for the presence of these behaviors. Using Piaget's constructivist theory, we show how research in this area can be interpreted without assuming that infants have advanced social cognitive abilities. We argue that infants' referential behaviors are motor signifiers of thought and that infants recognize humans as particularly relevant objects for their goal-directed behaviors. Finally, we describe how the field of infant joint attention research should proceed if a comprehensive understanding of infant cognitive processes is to be desired.

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The phenomenon of joint attention in infancy has enjoyed a great deal of attention in cognitive and developmental literature. The term "joint attention" generally refers to the ability to coordinate sharing attention with another person (Bates, Camaioni, & Volterra, 1975; Scaife & Bruner, 1975). Behaviors people use to coordinate visual attention include alternating gaze between a person and an object, pointing to an object in the presence of a person, and following the gaze of a person who has indicated her direction of attention.

Near the end of the first year of life, infants begin demonstrating these behaviors (Bates, O'Connell, & Shore, 1987; Butterworth, 1995; Carpenter, Nagell, & Tomasello, 1998; Desrochers, Morissette, & Ricard, 1995; Lempers, 1979; Leung & Rheingold, 1981; Zinober & Martlew, 1985), and there have been several debates in the infant literature on the theory behind the meaning of the presence of such referential behaviors in infancy (see for example the May/June 2007 volume of *Child Development*).

One side of these debates stem from social cognitive researchers describing referential behaviors as indicative of "joint attention." According to theorists with this view, as long as the adult is attending to what the infant is attending to and the infant points, reaches, or looks at the adult any time during the interaction, the infant is said to be participating in joint attention (see for example Liszkowski, Carpenter, Striano, & Tomasello, 2006; Morales, Mundy, Crowson, Neal, & Delgado, 2005; Tomasello, 1995). In this case, researchers attribute the presence of referential gestures to the infant having the complex social cognitive ability of either intent to share information or understanding of the intent of others to share information (Bakeman & Adamson, 1984; Carpenter et al., 1998; D'Entremont & Seamans, 2007; Tomasello, Carpenter, & Liszkowski, 2007).

Explaining infant behaviors in this way makes several assumptions about the nature of infant thought. First, it assumes that infants *can* be aware of another person's subjective attention or experience. In other words, it implies that infants have

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a theory of mind. However, a large body of research describes the emergence of theory of mind at approximately age 5 (see [Flavell, 2000](#) for a review). In addition, it assumes that infants can keep more than one variable of a situation in mind at a time and can flexibly switch their visual attention in social and object exploration situations.

Interestingly, Piagetian theory seems to be difficult to locate in the discussion of social cognition generally and joint attention specifically. Its inclusion as the primary theory in developmental and educational textbooks for explaining infant and early childhood behavior and learning seems disconnected from discussions in the infant research literature. None of the social cognitive research on joint attention seems to actually test Piaget's theory of egocentric thought ([Piaget, 1954](#)). For example, what evidence exists that the infant could keep an object and adult in mind at the same time or whether the infant's focus of attention merely changed from the object to the adult?

According to Piagetian theory, infants should not be able to participate in episodes of joint attention in which the infant is intentionally sharing information she thinks the other person does not know. Instead, infants act with agency, and adults are vulnerable to attributing mature social meaning to infant actions. Certainly infants can think about situations and objects, but they cannot think about other people's mental states. The egocentric infant would assume that everyone is looking at what he/she is looking at. The mere presence of pointing or gaze following does not provide evidence of infants' understanding of mindedness. To say so is letting theory get ahead of evidence and committing a confirmation bias. Or, it is a threat to internal validity, because there are alternative explanations that are equally plausible and actually well supported by evidence.

In this article, we will demonstrate how current evidence actually supports and does not refute Piagetian theory. Assuming that infant thought is egocentric and that infant learning is constructivist, the presence of infant referential gestures need not be explained as evidence of a mature social cognitive ability. We will discuss this misconception and describe joint attention and referential behaviors from a Piagetian perspective. In addition, we will show how research on executive attention may be useful for interpreting the presence of referential behaviors in infancy.

## 1. A brief history of joint attention research

The presence of referential behaviors in infancy was first described in exploratory studies. [Scaife and Bruner \(1975\)](#) reported that in the first year of life infants follow the gaze of others with age-related increasing accuracy, and [Bates et al. \(1975\)](#) reported that infants point to objects in the presence of others. Several theorists have described something qualitatively unique, a sort of intersubjective nature, to human interaction when compared to object exploration ([Bruner, 1975](#); [Trevarthen, 1998](#)). Subsequent studies provided further description of the various types, functions, and contexts of referential behaviors in infancy (see for example [Moore & Dunham, 1995](#)).

These early exploratory studies and theoretical discussions of referential behaviors and joint attention provided an exciting context in which to examine infant referential behaviors because they described the social communication of infants prior to language. What these studies did not provide is generalizable evidence of infants' understanding or mental capabilities within a social interaction.

Once the concept of joint attention became a topic of discussion in the infant literature, its conceptualization and measurement was described but in an unclear and inconsistent manner. For example, researchers use the term "joint attention" to refer to a variety of states, contexts, and behaviors. Some referred to it as an episode or event in which two people visually attend to the same thing, with no mental state implied (see for example [Butterworth & Jarrett, 1991](#); [DeBaryshe, 1993](#); [Dunham, Dunham, & Curwin, 1993](#); [Dunn, Wooding, & Hermann, 1977](#); [Messer, 1978](#); [Rocissano & Yatchmink, 1983](#)) or as an event in which people produce referential behaviors that show awareness of the unique properties of people and their direction of gaze (see for example [Bruner, 1975](#)). Other researchers describe joint attention as observable behaviors that indicate two people's awareness that they are seeing and expressing affect about the same thing ([Tomasello, 1995](#); [Mundy et al., 2003](#); [Seibert, Hogan, & Mundy, 1982](#)). These researchers have concluded that the presence of a cognitive joint attention state includes the presence of any referential behaviors in any temporal order in the presence of a social partner ([Bakeman & Adamson, 1984](#); [Mundy et al., 2003](#); [Seibert et al., 1982](#)).

Conceptualizing joint attention as an episode supports its use as an important context during which adults could manage children's attention and facilitate play, supporting language development in a manner reminiscent of Vygotsky's scaffolding ([Vygotsky, 1962](#)). Conceptualizing joint attention as a state precludes other explanations for the infant's behaviors and makes assumptions about the infant's mental capabilities. How do we know the infant could keep the object and adult in mind at the same time? How do we know the infant's focus of attention did not merely change from the object to the adult? How do we know that the infant is not just focused on the object and the adult makes this experience more pleasurable? Studies of joint attention in infancy do not test the infant's awareness of looking at the same thing as the adult or explain why an infant would look to a person's face during toy exploration.

Interestingly, there is evidence that different types of referential behaviors should not be considered indicative of a mentalist view of joint attention. Most referential behaviors are not correlated. For example, [Slaughter and McConnell \(2003\)](#) found that gaze following and social referencing in infants between the ages of 8 and 14 months were not correlated. [Mundy, Card, & Fox \(2000\)](#), [Mundy & Gomes \(1998\)](#) and [Vaughan et al. \(2003\)](#) found few significant cross-domain correlations between responding to the pointing and head turn of an adult and infant production of referential gestures such as pointing and visual checking. The results of these studies suggest a need to examine initiating and responding behaviors as well as social referencing separately in terms of their role in object exploration and social interaction.

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