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The Attribution of Intentionality to Novel Objects

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Previous research by this author and collaborators (Johnson et al., 1996) used a gaze-following paradigm (Scaife & Bruner, 1975) to show that 12-month-old infants use the behavioral as well as perceptual characteristics of novel objects to classify them as intentional or non-intentional entities. Furthermore, infants' resulting classifications do not correspond to a simple distinction between people and non-people.

Johnson et al. (1996) presented infants with a medium-sized, naturalistically-shaped, -colored, and -textured novel object that varied along a series of dimensions previously proposed as central to the detection of intentional objects: person-hood, facial features, and contingently interactive behavior (see Spelke, Phillips, & Woodward (1995) for a review of proposals). Johnson et al. found that after interacting with the ambiguous object for only 60 seconds, 12-month-olds would follow its 'gaze' when it shifted its orientation away from them. When the object had a clearly visible face and interacted contingently with them, infants were as likely to follow its gaze as that of an human adult. They also followed its 'gaze' when the object *failed* to interact contingently with them, but had a visible face or even if it did *not* have a visible face, but nonetheless interacted contingently with them.

Importantly, infants' following behavior was not elicited under all conditions with the object. If the same object had neither a visible face, nor interacted contingently with the baby, infants did not shift their own attentional direction to match the orientation of the object. Infants' 'gaze'-following behavior in general, therefore, appears to have been driven selectively by a particular configuration of behavioral and morphological characteristics, specifically those theorized as underlying attributions of *intentionality* rather than *person per se*.

Many questions are raised by these studies. Central among them is the exact nature of the representations underlying gaze-following behavior. The primary goal of the current research is to explore the relationship between object characteristics which elicit gaze-following behaviors in infants and those which elicit verbal attributions of intentionality by adults.

Experiment

Subjects

Fifty-three college undergraduates were tested in the 4 novel object conditions of Johnson et al. (1996).

Method

Each subject was shown one of the object conditions used in Johnson et al. (1996), with one change. Since adults were not expected to engage in spontaneous contingent vocal interactions with the object (as do babies),

the contingent interaction was instead modelled by a confederate who talked with the object. The conditions were 1) contingently interacting object with a face, 2) non-contingently interacting object with a face, 3) contingently interacting object without a face, and 4) non-contingently interacting object without a face.

Subjects were given 60 seconds of familiarization with the object, followed by 6 trials in which the object rotated 45 degrees to one side or the other and paused. At the end of the entire sequence each subject completed a verbal questionnaire. Subjects were asked to describe and explain what they had seen.

Results and Discussion

Adult's verbal descriptions were coded for intentional attributions to the object, e.g., it was 'looking around', or it 'wanted to talk'. Each subject was then coded as a User or Non-user of mental descriptors (Table 1). A two-way analysis of variance showed main effects of both the presence of a face ($F(1,49)=9.43, p<.01$) and contingency ($F(1, 49)=6.16, p<.02$), as well as a significant interaction between the two ($F(1,49)=16.11, p<.005$). The findings show a striking correspondence between those conditions in which babies follow the gaze of the novel object and those in which adults describe the object in intentional terms, suggesting that gaze-following in infancy and intentional classification of novel objects in adulthood are driven by the same mechanisms.

Table 1: Verbal reactions of adults to novel object used to elicit gaze-following in infants by Johnson et al (1996).

novel object condition	n	%S using mentalistic descriptors	Objects that elicit infants' gaze-following
Contingent/Face	12	67	yes
Non-contingent/Face	12	83	yes
Contingent/No Face	13	77	yes
Non-contingent/No Face	16	6	no

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