



Infants' ability to connect gaze and emotional expression to intentional action

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Abstract

Four studies investigated whether and when infants connect information about an actor's affect and perception to their action. Arguably, this may be a crucial way in which infants come to recognize the intentional behaviors of others. In Study 1 an actor grasped one of two objects in a situation where cues from the actor's gaze and expression could serve to determine which object would be grasped, specifically the actor first looked at and emoted positively about one object but not the other. Twelve-month-olds, but not 8-month-olds, recognized that the actor was likely to grasp the object which she had visually regarded with positive affect. Studies 2, 3, and 4 replicated the main finding from Study 1 with 12- and 14-month-olds and included several contrasting conditions and controls. These studies provide evidence that the ability to use information about an adult's direction of gaze and emotional expression to predict action is both present, and developing at the end of the first year of life. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

How do infants understand the behavior of the people around them? A crucial task involves understanding people in intentional terms as adults do. In the larger sense, adults see people as having intentional mental states, e.g. beliefs *about* the world, desires *for* things. In the narrower, everyday sense they construe actions as purposive and goal-directed. What are the origins of this intentional understanding? Over the last 10 years

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research has demonstrated that preschoolers and toddlers share this “intentional stance” – thus, they employ a variety of intentional mental-state constructs to reason about persons’ actions (e.g. Lillard & Flavell, 1990); they conversationally describe and explain human behavior in terms of what the person “wants”, “thinks”, and “knows” (e.g. Bartsch & Wellman, 1995); and they distinguish intended voluntary actions from unintended biological or physical movements such as a person shaking with fever or being blown down by the wind (e.g. Inagaki & Hatano, 1993; Schult & Wellman, 1997). Recent findings suggest that even 1.5- and 2-year-olds are able to reason about persons’ intentions (Baldwin, 1991; Carpenter, Aktar, & Tomasello, 1998; Meltzoff, 1995; Repacholi & Gopnik, 1997). What remains to be investigated are earlier developments, specifically infants’ understanding of intentional states and acts.

Our research is guided by a general framework for addressing this question. We acknowledge, as philosophers and psychologists have long pointed out, that action can be described at several contrasting levels, for instance, behavioral motions of the body vs. intentional actions. Behavioral features are not essential to intentions: one can intend to do something but then not do it; an intentional and non-intentional movement can appear behaviorally identical. While not *essential* to intentional action, nonetheless, certain perceivable features (overt movements and expressions) can often help *identify* a behavior as intentional. These features serve to signal a behavior’s underlying intentionality – that this behavior is an intentional action – and thus can work to identify intentions, because intentions, when enacted, often (though not always) yield behaviors of a certain form. If so, what features of perceivable behavior, both movements and expressions, might plausibly indicate and manifest intentionality? And of these which might be detected by infants? There are several candidates (see e.g. Baldwin & Baird, 1999) but we concentrate on two: intentional acts are often directed toward certain target objects, and behavioral movements often systematically relate to the actor’s gaze, facial expressions, and vocalizations.

Intentional actions, in many simple situations involving actions on objects, can manifest a distinctive directedness to specific objects, reflective of the intention’s underlying goal-directedness. We will term this *object-directedness*. Specifically, when an agent acts intentionally toward an object the movement dynamics often result in an approach to (or avoidance of) the object, or contact with, acquisition of, consumption of the object. Thus, in simple action situations at least – a person reaching for an ice cream cone, a hand pulling a cup towards a body, a child grasping a toy – the goal-directedness of intentions can result in a perceptually identifiable object-directedness manifest in behavior.

Beyond object-directed movement itself, an intentional actor often manifests other characteristic movements, expressions, and postures. Consider reaching for and grasping a toy. Typically, such behavior requires perceptual apprehension and then guidance – manifest in head and eye orientations and trajectories. Launching the reach and guiding it might be manifest in a furrowed brow of concentration. If the intention is positive and to approach the object it can be preceded by and manifest in distinctive facial expressions – those associated with interest, pleasure, anticipation. Vocal accompaniments also often co-occur – “There”, “yes!”, “ahh”. If the intention is negative, this can be manifest in fearful, displeased, avoidant expressions and vocalizations. Actually obtaining the target object can result in distinctive facial expressions – those associated with happiness at success, or

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