You Can’t Always Get What You Want: Nine-Month-Olds Don’t Expect Helpers to Consider Others’ Preferences

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Infants are motivated to help others very early in life, but when do they cognitively understand the best way to help? The present study explores 9-month-old infants’ expectations about the link between subjective object preferences and helping. When 9-month-olds see someone repeatedly approaching the same object, they seem to encode that object as the actor’s goal or preference. However, it is unclear whether infants can use this goal representation ability in order to reason about helping. In the current study, twenty-four 9-month-olds were habituated to videos of a male actor reaching for and grasping one of two objects in front of him while a female actor observed. The objects then switched positions and were placed out of the male actor’s view and reach. During the test events, the male actor requested an object from the female actor, and the female actor subsequently offered him one of the two objects. I hypothesized that infants would use the information provided about the male actor’s preference to form expectations about how the female actor would try to help, and that the infants would therefore be more surprised and look longer when female actor offered the non-preferred object. However, infants did not look longer at either of the test events and instead looked longer toward whichever type of test event was shown first. This finding suggests that infants did not have a clear expectation regarding which object the helper would offer. To better understand this null result, several follow-up studies are proposed.

Helping is a complex social behavior that requires one to recognize when another person is in need of help, understand the means to assist the person in achieving his goal, and have the motivation to help. Despite the complexity of these behaviors, infants as young as 14 months are capable of helping others. For instance, 14-month-olds can help people who are struggling to obtain out-of-reach objects by offering people their desired object (Warneken & Tomasello, 2006). Although 14-months-olds’ altruistic behaviors are limited to these simple instrumental helping situations, 18-months-olds are capable of altruistically responding to even more complex situations. For instance, 18-month-olds can help individuals who are failing to achieve their goals because a physical obstacle prevents them or they are using the wrong means to achieve their goals (Warneken & Tomasello, 2006). By 18 months, infants are also able to identify another person’s food preferences and offer food based on those preferences, regardless of the infants’ own preferences; in contrast, 14-month-olds tend to offer food based on their own food preferences (Repacholi & Gopnik, 1997). Based on this research, it appears that complex helping behaviors emerge around 14 months and rapidly develop within a few months. However, it is still unclear whether the failures of 14-month-olds in helping situations are the result of absent cognitive skills (e.g., misunderstanding the correct way to help) or motivational failures (e.g., lacking initiative or reacting egocentrically rather than altruistically). The present study parses these explanations in order to identify the mechanism of failure, which is essential to understand the nature and origin of helping behaviors in young infants.

Extensive research has shown that even very young infants understand a great deal about helping situations, such as the preferences of other people and the ways in which to help others. Six-month-olds can recognize the goal-directed actions of an agent directed toward a specific object
(Woodward, 1998), which is a preliminary cognitive ability to recognize an agent’s preferences. By seven months, infants can identify a variety of gestures, such as pointing, reaching, and grasping, as goal-directed actions (Hamlin, Hallinan, & Woodward, 2008). Furthermore, six-month-olds can use their abilities to recognize goal-directed actions in order to infer people’s preferences for one object over another (Luo & Johnson, 2009). By nine months, infants recognize that goals are associated specifically with the individual who performed the goal-directed actions and that these goals do not necessarily generalize to others (Buresh & Woodward, 2007). This finding that infants can associate goals with specific individuals suggests that infants may also be able to associate preferences with specific individuals as well.

Recognizing the goals of others is a prerequisite ability to identifying when others are in need of help in achieving their goals. Furthermore, in order to help others, one must recognize another’s intended goals before they have been accomplished, and understand the appropriate means necessary to achieve these goals. Hamlin, Hallinan, and Woodward (2008) demonstrated that infants are capable of doing all of the above. In their experiment, 7-month-olds observed an experimenter attempting but failing to acquire an object. Rather than imitating the experimenter’s failed attempts, the infants were able to acquire the experimenter’s desired object, which suggests that 7-month-olds have the cognitive abilities to recognize someone’s intended goal and to understand how to achieve this goal.

Despite previous research indicating that young infants are able to recognize people’s preferences, identify when someone is in need of help, and understand the means to help, recent research (Hobbs & Spelke, in prep) suggests that 14-month-olds are often unable to make use of their understanding of others’ preferences in their helping behaviors. In this experiment, 14-month-olds watched as the experimenter repeatedly grasped one of two objects on the table in front of her to indicate a preference for one object over the other. The objects were then placed nearer the infant, seemingly out of the experimenter’s reach, and the experimenter elicited the help of the infant. This scenario was presented to each infant four times using four different sets of objects. Despite implementing three methodological variations to the study design, varying the amount of time and contact the agent spent examining the objects as well as varying whether or not the agent could perceive the objects during the test phase, all three variations yielded the same results: the 14-month-olds repeatedly failed to correctly offer the experimenter her preferred object.

Did the 14-month-olds in these studies fail with the cognitive or motivational component of helping? Approximately 70% of the participants in Hobbs and Spelke (in prep) offered an object to the experimenter at least once during the four trials, suggesting that they understand the request for help. Infants as young as six months can recognize others’ preferences (Luo & Johnson, 2009); however, the 14-month-old infants in the Hobbs and Spelke (in prep) were equally likely to offer the actor’s preferred and non-preferred object. This finding suggests that infants may not yet understand how the actor’s preference relates to helping the experimenter in these situations. Alternatively, perhaps these infants are failing on a motivational level by not being sufficiently motivated to help the experimenter in accordance with the experimenter’s preferences. Like the 14-month-old infants in Repacholi and Gopnik’s (1997) study who offered the agent the child’s own preferred food, perhaps these infants’ actions were influenced by their own preferences. When the infants failed to offer an object, they often failed by keeping one or both objects for themselves or by not reaching for either of the objects. Even when the infants did offer an object, the infants’ actions may have been influenced by their own preferences if they were motivated to keep the preferred object for themselves.

Although previous research with 14-month-olds does not address whether cognitive or motivational failures cause the infants’ inability to help others in accordance with their preferences, I propose that it may be more likely that infants are failing at a motivational level. Because 7-month-olds already understand a great deal about helping, such as recognizing preferences, identifying requests for help, and understanding the means to help, it is unlikely that they fail to understand these situations at 14-months. The present study sought to address this issue by placing infants in a third-party perspective, thereby eliminating potential confounding motivational factors, such as infants’ personal motivations to help others and their own personal preferences towards objects. Specifically, infants were asked to watch helping situations rather than participate in them. This study used a visual-habituation paradigm to explore the extent of infants’ cognitive understanding of helping situations. This study was conducted with 9-month-old infants, which subsequently allowed me to compare the present findings to those of previous re-
searchers that have utilized similar age groups and designs.

In the present study, infants were habituated to videos of a male actor reaching toward and grasping one of two objects in front of him on a table, indicating he has a preference for one object over another, while a female actor observed. Following habituation, the objects were placed out of the male actor’s reach. The male actor then elicited the help of the female actor, who offered him one of the objects. Infants saw the female actor offer the previously preferred object and the other object (non-preferred) in alternating trials. Based on young infants’ ability to recognize individualized preferences, I predicted that infants would expect the female actor to offer the preferred object and would be surprised when she offered the non-preferred object. I therefore hypothesized that infants would look longer when the female actor offered the non-preferred (vs. preferred) object.

METHOD

Twenty-four full-term infants (12 females, 12 males; mean age = 9 months, range: 8 months and 15 days to 9 months and 15 days) living near Cambridge, Massachusetts, participated in this study. Families were contacted to participate using information collected from birth records at local town halls, from responses to advertisements, and from expressed interest on the laboratory’s website. Participants received a small gift, and the caretaker received a $5 travel reimbursement. Two additional infants were eliminated due to live coding errors, and four additional infants were excluded for fussiness.

The participants sat or stood on their caregiver’s lap in front of a large screen, which was surrounded by black and white curtains to minimize distractions. One camera recorded a frontal view of the participant’s face through a hole under the screen. To identify when the infant was and was not attending to the stimuli presented on the screen, the experimenter initially calibrated the direction of the participant’s gaze by verbalizing when the infant was looking “on” or “off” of the area on the screen where the stimuli would appear. A coder in the adjacent room observed and indicated via controller when the participant was looking at the screen. Behind the screen, the experimenter used Keynote, to control the presentation of the stimulus videos, and XHAB, to calculate subjects’ total looking time for each trial based on the coder’s live judgments.

Each participant saw four types of videos of a male and female actor interacting: introduction scene, habituation, switch scene, and test videos (Figure 1). Both actors maintained neutral facial expressions and manner of speech throughout the videos. The male actor was situated between two objects, a brown bear and an orange basketball, that were placed shoulder-width apart either on top of a ledge on the table (during habituation) or on the table in front of the ledge (during the switch scene and test videos).

The introduction scene was a 10-second video of the actors greeting each other and simultaneously looking at each of the objects. In the habituation videos, the actors simultaneously looked toward each object then the male actor said, “Cool. Neat,” as he reached for the second viewed object (preferred object). These videos ended the moment the actor grasped the object (Figure 1A). The switch scene was a 10-second static image of the objects, located on the table in front of the ledge, without the actors present (Figure 1B).

In the test videos, the male actor looked toward the right then left, toward the locations on top of the ledge where the objects had previously been during habituation, while saying “Oh, where did it go?”. The male actor then reached toward the female actor with an open, palm-up hand (i.e. a requesting gesture) while saying, “Can you help me?”. The female actor then placed one of the objects in the male actor’s hand. These videos ended the moment both actors were in contact with the object. Each participant saw the female actor offer the preferred object (congruent) and the non-preferred object (incongruent) (Figures 1C, 1D). A black screen appeared from bottom to top and top to bottom that acted as a curtain to transition between all of the videos at the conclusion of the trial. These transitions created a time lag between trials of approximately six seconds.

The experimenter began the study by calling out to the infant saying, “Look (infant’s name)!” in an infant-directed manner, before the start of the introduction scene. Modeled after Woodward (1998), the habituation criterion was calculated for each subject by adding the infant’s total looking time for the first three consecutive habituation videos that summed to 12 or more seconds, and dividing this total in half. The habituation phase ended when the infant’s total looking time for three additional consecutive videos summed to less than the infant’s habituation criterion (Woodward, 1998). If
an infant did not reach criterion after 14 habituation trials, the infant advanced to the next portion of the study (Woodward, 1998). Infants therefore saw a minimum of six and maximum of 14 habituation trials.

Next, each infant saw one switch scene in which the objects positioned at the base of the ledge without the actors present and the objects’ lateral positions were reversed from habituation. Introducing this video, the experimenter said, “Look! There’s something different” and halfway through this scene, “The toys have moved.” This change in language accentuated the change between videos and emphasized the different positions and locations of the objects.

Each infant then saw four test events, alternating between the two types of test videos (congruent and incongruent). The order of these test trial types was counterbalanced across all infants as was which object was preferred and the lateral positions of these objects.

RESULTS

To calculate the amount of time each participant attended to certain aspects of the videos, the experimenter initiated XHAB to begin recording at specific moments during the habituation and test trials. Coding of the habituation trials was initiated the moment the habituation video was paused on the final frame; thereby, calculating how long the participant looked at the lingering scene of the inactive people. If an infant did not watch the majority of a habituation video, the experimenter immediately advanced to the next habituation video without initiating a trial in XHAB. The test trials were initiated immediately after the male actor said, “Can you help me?” while requesting an object from the female actor. The amount of time from this moment to the end of the video, when the female actor placed an object in the male actor’s hand, similarly pausing on the last frame, was approximately five seconds. All trials ended once the infant looked away for two consecutive seconds. To determine the reliability of the coder’s judgments, additional post hoc coding, that measured the coders’ inter-rater reliability for 11 of the 24 subjects, averaged 93.7% of agreements.

Infants saw an average of 9.63 habituation trials. Eight infants saw the maximum 14 habituation trials while 11 infants habituated in six. Of the eight infants who saw 14 habituation trials, only two met habituation criterion in the final trial. To examine if the participants, as a group, were habituating to the events, a repeated measures analysis of variance examined infants’ total looking toward...
the first three habituation events, summing to greater than 12 seconds, to infants’ total looking time for the last three habituation events, with the preferred object (ball or bear) as a between-subjects factor. This analysis revealed a significant main effect comparing infants’ total looking times toward the first and last three habituation events, $F(1, 22) = 35.89, p < .001$, indicating that infants’ looking times significantly decreased from the beginning to the end of the habituation phase. This analysis also revealed a significant interaction between the first and last habituation events and the preferred object, $F(1, 22) = 10.02, p = .004$, indicating that infants’ looking times during the habituation phase were influenced by which object was preferred during habituation. Infants appeared to have an initial preference for the bear because the infants who saw the bear as the preferred object looked longer at the first three habituation events ($M = 46.96s$) compared to the infants who saw the ball as the preferred object ($M = 24.12s$). However, infants’ looking times for the last three habituation events were very similar (ball: $M = 14.66s$, bear: $M = 16.31s$), indicating that the initial preference for the bear did not affect infants’ responses by the end of habituation.

Preliminary analyses revealed no effects of infant sex, direction of reach during habituation, or whether the infants met criterion or saw 14 habituation trials. Subsequent analyses collapsed across these measures. I hypothesized that infants would look longer during the incongruent trials (when the female actor offered the non-preferred object) than during the congruent trials (when the female actor offered the preferred object). Each infant’s looking times toward the incongruent and congruent trials were averaged across test pairs. A repeated measures analysis of variance was then conducted with test trial type (incongruent or congruent) as the within-subjects factor and order (incongruent first, ICIC, or congruent first, CICI) and preferred object (ball or bear) as the between-subjects factors. For each of three infants, one pair of test trials was excluded due to fussiness or looking times that qualified as statistical outliers. Contrary to our predictions, the ANOVA revealed no significant main effect of test trial type, $F(1, 20) = .002, p = .961$, indicating that infants did not look longer toward either test event. However, the ANOVA did reveal a significant test trial type by order interaction, $F(1, 20) = 7.02, p = .015$, which revealed that infants looked longer toward the type of test events that were shown first (Figure 2). Figure 3 further demonstrates how this interaction appears to be driven by infants’ responses to the initial test event. Additionally, no significant interaction between test trial type and preferred object was found, $F(1, 20) = .647, p = .431$, indicating that infants’ looking times were not driven by which object the actor reached for during habituation.

**DISCUSSION**

This study hypothesized that 9-month-old infants would utilize their understanding of others’ preferences to form expectations about how the female actor would help the male actor attain an object that was out of his reach. Specifically, it was hypothesized that infants would expect the female actor to offer the male actor the object he had preferred (congruent), such that infants would demonstrate longer looking times during the incongruent test events (i.e., when the female actor offers the disregarded object) because her actions contradict their expectations. However, no significant differences in looking times between congruent and incongruent test events and no significant main effect of test trial type were found. These results suggest...
that the infants did not form expectations about the female actor’s helping behaviors. There are several possible explanations as to why the infants failed to differentiate between the test events, such as cognitive overload from the stimuli and a genuine lack of conceptual understanding of preferences.

One possible explanation for the present null findings is that infants were overwhelmed by the presence of the two actors and the two objects in the stimuli. Perhaps the presence of the second actor, a figure not present in previous studies of this kind, distracts the infants from focusing on the primary actor’s actions, and therefore, they do not recognize the actor’s preference. If infants are habituating to the presence of the actors but not to the primary actor’s actions, then we should not expect infants to distinguish between the test events (e.g., looking longer toward one of the events).

Infants’ responses to the test events may also have been influenced by the salient novel actions of the second actor. Perhaps infants were primarily attending to the novel movements of the female actor regardless of whether or not her actions were helpful or unhelpful. This may have resulted in the finding that infants looked longer toward the first type of test events they saw.

Alternatively, the null results may indicate that 9-month-old infants lack a genuine understanding of preferences and/or helping. Perhaps 9-month-olds do not yet form expectations about how object preferences can be incorporated into helping behaviors, or perhaps infants are failing on a more basic level to recognize others’ preferences towards objects. This may have resulted in the infants’ inability to discriminate between when the female actor offered the male actor his preferred or non-preferred object.

Based on the present findings and possible interpretations of the results, it may be beneficial for a follow-up study to determine whether the stimuli used in this study are too overwhelming for infants at nine months. This follow-up study should replicate Woodward’s (1998) study design, while using the video stimuli from the present study involving two actors. Using the same habituation stimuli as the present study, infants should first be habituated to one actor grasping for one of two objects, while the second actor observes. Infants should then see the first actor alternate between grasping each of the objects, while the second actor continues to observe. If this study continues to yield null main effects when comparing infants’ looking time toward the new path/old goal and old path/new goal events, these results could suggest that the stimuli are somehow defective or overwhelming.

However, if the study proposed above does successfully replicate Woodward’s (1998) findings, these results could suggest that 9-month-olds are failing to conceptually understand how preferences can influence helping situations. Alternatively, success in this proposed replication study, combined with the null findings in the present study could indicate that infants are strongly influenced by the initial novelty of the actions of the second actor. To further explore this possibility, an additional familiarization trial should be added to the original study as a type of pre-experimental trial, during which the male actor should gesture for a single out of reach object, unique to this trial, and the female actor should then proceed to offer this object to the male actor, thereby eliminating any novel responses to the second actor’s actions. A non-significant finding in this study would provide further evidence that 9-month-olds fail on a conceptual level to understand these helping situations. If this is indeed the case, the present study should be replicated with older infants (e.g., 12-month-olds), in order to directly compare these findings with those of previous research examining infants in this same age range.

The present study is the first of many that should continue to explore what infants understand about helping and preferences. Previous research shows that by two years of age, infants are altruistic and motivated to help others without any benefit to themselves. However, before successfully helping someone achieve a goal, infants must first recognize that the person has a goal and understand what that goal is. This cognitive ability to identify individual’s goals from the individual’s intentional, goal-directed actions arises early in infancy (Woodward, 1998). Other research indicates that infants are sensitive to who is performing the intentional action and to the purposefulness of an agent’s actions, indicating that infants recognize that goals are specific to individuals and that not all actions of an intentional agent reflect goals (Bursch & Woodward, 2007; Woodward, 1999). Furthermore, Luo and Johnson (2009) found that 6-month-old infants attributed an object-preference to an agent only when the agent could perceive and actively choose between two objects, suggesting that infants can infer individual’s mental states, such as preferences from a person’s goal-directed actions.

Given that infants can identify other people’s goals and preferences, will they successfully use this
information to help others? Although infants as young as 14 months will successfully help a stranger obtain a desired object (Warneken & Tomasello, 2007), they also fail to accurately offer an experimenter his preferred object or food (Hobbs & Spelke, in prep; Repacholi & Gopnik, 1997). Is this failure to correctly help at 14 months indicative of a cognitive or motivational failure? Previous research with younger infants suggests that they understand the necessary components to help in these situations, and the present study expanded this research by exploring whether infants will utilize their understanding of preferences to form expectations about others’ helping behaviors. The current study found that the infants failed to differentiate between events based on the requestor’s preference, indicating that 9-month-olds may fail to integrate their representations of preferences with their reasoning about helping as a social interaction.

Why might infants fail to combine their understanding of preferences and helping? Adults readily use information about others’ dispositions and beliefs to guide their own social interactions, including helping behaviors. Although it appears that infants are able to understand preferences and engage in helping behaviors, perhaps they do not connect these two domains as well as adults do. How might infants cognitively develop the link between these two domains? One possibility is through the development of language. Developing language profoundly affects infants’ cognition of mental states and helping. For example, consider how understanding desire is linked to learning such desire words as “want” and “need.” Perhaps as infants’ cognition advances through language, infants may be able to recognize how helping and preferences are closely related.

References


Hobbs, K., & Spelke, E. (in prep). Goal Attributions and Instrumental Helping in the Second Year of Life.


