



HHS Public Access

Author manuscript

Child Dev Perspect. Author manuscript; available in PMC 2019 September 01.

Published in final edited form as:

Child Dev Perspect. 2018 September ; 12(3): 141–145. doi:10.1111/cdep.12283.

Infants' Understanding of Distributive Fairness as a Test Case for Identifying the Extents and Limits of Infants' Sociomoral Cognition and Behavior

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Abstract

In this article, I use infants' sensitivity to distributive fairness as a test case to identify the extents and limits of infants' sociomoral cognition and behavior. Infants' sensitivity to distributive fairness is in some ways commensurate with this understanding in older children and adults; infants expect fair distributions of resources and evaluate others based on their adherence to or violation of fairness norms. Yet these sensitivities also differ in important ways, including that infants do not spontaneously punish unfair individuals. I address questions about the role of experience in infants' development of sociomoral cognition and behavior, and whether infants' moral cognition and behavior are differentiated appropriately (from their social knowledge and behavior) and integrated (across subspects of morality). I suggest two approaches to move the field forward: investigating processes that contribute to developing sociomoral cognition and behavior, and considering infants' successes and failures in this domain.

Keywords

social-moral cognition and behavior; prosocial behavior

Scholars have long been interested in the developmental origins of our moral sentiments and behavior. Initial psychological research suggested that moral knowledge and behavior arose from the development of sophisticated reasoning processes, so a true sense of morality was seen as a relatively late accomplishment, achieved in adolescence or later (1, 2). Subsequent work pushed the origins of morality to the preschool years by demonstrating that children reason differently about violations in the moral, societal, and psychological domains, and tend to see moral actions as abiding by a unique set of principles (3-5).

However, over the last 10 to 15 years, researchers have begun to investigate the origins of morality in the first two years of life. Several factors have driven these investigations. First, mature moral judgments apparently not only rely on complex, explicit reasoning processes, but also stem from more implicit processes such as moral emotions that are, or may be, available to infants (6, 7). Second, moral tendencies may serve an adaptive value, suggesting a possible evolutionary basis (8) and early appearance. Third, research indicates that by at

least the second year of life, infants behave toward others in ways that suggest at least some hallmarks of morality (9). And fourth, infants' social-cognitive knowledge is much more sophisticated than originally thought (10).

In this article, I identify the extents and limits of infants' sociomoral knowledge and behavior, using infants' understanding of distributive fairness as a test case. I review the evidence to suggest that over the course of the first year, infants' representations of outcomes related to distribution of resources develop key features shared with adults, but differ in at least one important way. I consider the role of experience in infants' developing sensitivity to distributive fairness and highlight important lines of inquiry. I conclude with two recommendations for the field.

Infants' Developing Sociomoral Cognition and Behavior: Distributive Fairness as a Test Case

While adults endorse many different models regarding how resources should be distributed, under conditions where all else is equivalent or lacking background information regarding recipients, they often believe resources should be distributed equally to recipients (11). In economic games, adults tend to divide resources equally between themselves and anonymous social partners (12); moreover, they punish others who do not adhere to this norm, even at a cost to themselves (13). Fair offers in such games activate reward regions in the brain (14), whereas unfair offers activate brain areas associated with negative affect (15). Furthermore, many of these effects extend into childhood: By roughly age 3, children endorse and expect resources to be distributed equally in third-party situations (i.e., situations in which infants observe, rather than participate in, distributions of resources; 16), protest unequal distributions (17), and share equally the rewards of a collaborative effort with a social partner (18).

To investigate infants' understanding of third-party distributive fairness, my colleagues and I identified potential processes that underlie this sensitivity, then tested for the presence or absence of these processes in infancy and beyond. Central to this approach is the idea that these underlying processes may, at least in principle, be distinct and therefore, may or may not follow similar developmental trajectories. Based on research with adults (see 11–18), we assumed that mature reasoners have baseline expectations about how others will distribute resources, evaluate individuals based on their adherence to or violation of these norms, and intervene to promote fair behavior and discourage unfair behavior (i.e., reward and punishment). Thus, in our research with infants and young children, we have systematically investigated whether and when these sensitivities emerge.

Expectations of Fairness

In our initial work on this topic (19), we investigated whether infants expect resources to be divided equally. Using a violation-of-expectancy paradigm, we showed resource distributions to infants that culminated in either fair outcomes (a 2:2 distribution) or unfair outcomes (a 3:1 distribution). Fifteen-month-olds paid more attention to unfair than fair outcomes, but looked equally at perceptually matched control outcomes that lacked social

context (19, 20). In subsequent work (21), expectations of fairness appeared to emerge between 6 and 12 months, with 10 months the earliest emergence of expectations of fairness (22).

These results may simply reflect infants' ability to track the statistical regularities of social events. For example, unequal outcomes to resource distributions may be rarer than fair outcomes, so infants may be sensitive to these probabilities. However, two pieces of evidence suggest this is unlikely. First, infants' enhanced attention to unfair outcomes is tied to aspects of their prosocial behavior. When given the opportunity to share one of two toys with a stranger, infants who share more generously (by sharing preferred toys) have stronger expectations of fairness than infants who share more selfishly (by sharing nonpreferred toys; 19–21). We know of no *a priori* reason why more generous sharers track statistical regularities more successfully than more selfish sharers. Rather, these findings are consistent with the claim that fairness and altruism are linked theoretically (23).

Second, a recent study of brain activity (using event-related potentials, ERPs; 24) investigated infants' responses to outcomes that varied in degree of unfairness: In one scenario, one recipient received 100% of goods and the other received 0%, whereas in another scenario one recipient received 75% of goods and the other received 25%. When tested under these circumstances, adults' brain activity varied according to the degree of inequity, with greater differentiation for events resulting in greater inequity. Like adults, 12-month-olds differed more in ERP waveforms in cases of egregious inequality when compared with cases of equality (100% versus 0%) than in cases of moderate inequality when compared with cases of equality (75% versus 25%). These findings counter the claim that infants' enhanced attention to unequal events is because unequal outcomes, broadly construed, are rarer than equal outcomes. If that were the case, one would expect infants to differentiate equal from unequal outcomes, but not necessarily to respond based on the degree of inequality within unequal outcomes.

Evaluations of Fair and Unfair Agents

Several studies have used forced-choice paradigms to assess infants' preferences for fair individuals. Such paradigms necessarily involve evaluative processes: To prefer one individual to another, infants must either like one individual more than the other or dislike one individual less than the other. In one study (25), after watching fair (2:2) and unfair (3:1) distributions, 15-month-olds chose systematically to receive toys from and play with fair actors rather than unfair actors. Using a similar paradigm, in another study (26), preferences for fair individuals extended at least to 13-month-olds. Infants also apparently expected others to prefer fair over unfair agents, starting at 10 months (27, 28).

However, infants' social preferences do not suggest that they positively evaluate fair individuals and negatively evaluate unfair individuals *per se* because preferences are merely rank orderings (e.g., infants could evaluate both individuals positively, but see the fair individual more positively than the unfair individual). In one study (29), infants as young as 13 months paired verbal praise with fair actors and verbal admonishment with unfair actors, showing stronger associations between the unfair actor and admonishment than the fair actor and praise. These findings suggest that infants' (negative) evaluations of unfair individuals

are apparently stronger than their (positive) evaluations of fair individuals. Moreover, the results tell us that infants may be considering how these resource distributions *should* proceed, given that they negatively evaluate those who transgress against fairness norms.

Intervening with Fair and Unfair Agents

Adults use reward and punishment to regulate others' behavior, especially regarding sociomoral norms. Recent evidence suggests that children punish third parties who violate moral norms (30), and that they apparently understand that punishment aims to deter specific behaviors (31). Yet little work has addressed whether infants reward and punish third parties. Moreover, studies have defined punishment as the selective removal of a resource from an antisocial (rather than a prosocial) agent after an experimenter requested that infants take a resource to ensure that a third agent has resources (32). Consequently, these results do not necessarily suggest that infants punish transgressors *per se*.

In one study (33), 16-month-olds were taught that pressing a panel on one side of a touch screen elicited reward (e.g., an actor received a cookie), whereas pressing a panel on the other side of the screen elicited punishment (e.g., an actor had a cookie taken away). Next, infants were shown fair and unfair distributions and then allowed to use the touch screen to administer reward or punishment to the fair and unfair actors. Infants systematically rewarded fair actors but did not punish unfair actors; control conditions ruled out the possibility that infants would reward any positively valenced stimuli.

These findings suggest that infants may not reward and punish in the same manner as older children and adults. Infants may not understand the function of reward and punishment; instead, their reward behavior may be more akin to moral approval. Alternately, infants may find punishment hard to enact because of its paradoxical nature: Punishing an individual requires an approach that is typically avoided. Finally, punishment is typically administered by those in a position of authority; infants may not feel sufficiently authoritative to punish others.

Summary

These results suggest that infants expect resources to be distributed fairly (i.e., equally) and evaluate others based on their adherence to or deviation from this norm. These tendencies may follow similar developmental trajectories, emerging between 10 to 12 months. Do the same types of experience that spur expectations regarding outcomes of resource distribution also drive infants' evaluations of the actors performing these outcomes? Since infants apparently do not reward and punish systematically, these findings also suggest that reward and punishment are not natural outgrowths of evaluation but may rely on different or additional processes.

Questions and Directions

Our results and those of others suggest that infants have some of the important building blocks of moral cognition and behavior. Yet the field is still young and questions remain. Next, I address questions and summarize current evidence.

What Role Does Experience Play in Infants' Sociomoral Knowledge?

A longstanding question in developmental psychology concerns the relative contribution of experience versus innate tendencies to knowledge and behavior. Perspectives diverge on early sociomoral cognition and behavior (34-37).

Some have argued that infants understand fairness innately (38). In our work, experience apparently influences infants' sensitivity to fairness in two ways. First, the developmental emergence of infants' expectations of fairness is tied to the emergence of sharing in natural settings: At 9 months, only infants who share toys with their primary caregiver expect fairness (21). Second, individual differences in infants' expectations of fairness beyond 12 months are linked to the presence or absence of siblings: Infants with siblings have stronger expectations of fairness than those without siblings. Experience may play a role in the development and elaboration of concerns about fairness for a range of reasons. Once infants can share, they not only have more exemplars of fair and unfair behavior, they have the opportunity to experience the emotional consequences of fair and unfair behavior as both actor and agent. Similarly, disputes with siblings over resources may enhance a basic sensitivity to fairness (21).

These findings suggest that experience is important for at least some developing aspects of sociomoral cognition. As a next step, we need to delineate the role experience plays. One possibility is that experience creates an understanding of sociomoral norms *de novo*. Another is that experience plays a more nuanced role: For example, experience may ground or instantiate abstract (presumably innate) representations infants typically have.

Distinguishing between these two possibilities empirically is difficult, because both accounts predict that experience plays an important role in sociomoral cognition and behavior—either in its emergence or in its expression. Nevertheless, I propose several ways for researchers to distinguish these possibilities. First, examining developmental trajectories of the acquisition of sociomoral constructs across cultures may shed light on this issue. A common developmental starting point across cultures would support the idea that experience instantiates pre-existing representations. Alternately, if infants across cultures vary in the nature of their sociomoral constructs from the point of developmental emergence, this would support the idea that experience constructs these representations *de novo*. A second way to distinguish these perspectives is to examine infants' and children's ability to learn norms that counter those that prevail in society; for example, if infants could be taught an unequal distribution norm as readily as an equal distribution norm, it would suggest that experience plays a role that is more than merely facilitative.

Are Moral Cognition and Behavior Differentiated or Integrated Appropriately?

Another question concerns the extent to which sociomoral cognition and behavior are differentiated (from social cognition and evaluation more broadly) or integrated (across moral subdomains) early in development. One defining criteria for moral judgments or evaluation is that moral concerns must separate intentions from outcomes (2). In the help/harm domain, infants can distinguish intentional from accidental prosocial outcomes and agents: By 8 months, infants prefer agents who act prosocially, but only when those actions

are intentional, not when they are accidental (39). Researchers are trying to determine whether this is also true in the context of distribution of resources, that is, whether infants evaluate distributions positively or negatively only when they are performed intentionally, not accidentally.

Another central defining feature is that moral judgments should be restricted to concerns about the well-being and fair treatment of others (1, 2, 4, 5). While infants evaluate unfair actors negatively, we do not yet know whether these negative evaluations are unique to moral transgressions or extend more generally to other types of violations (i.e., social conventions). Similarly, we do not know whether infants uniquely apply other criteria to moral transactions—that moral rules should be generalizable, independent of authority, obligatory, and unalterable (3-5).

A final question concerns whether knowledge and behavior are integrated within the moral domain. Some evidence suggests that 12- and 15-month-olds perform consistently across tasks purported to measure prosociality (20). In addition, infants' prosocial behavior at 12 and 15 months predicts selective prosociality toward fair agents at 21 and 24 months (40). Yet other work has found inconsistency in infants' performance across prosocial tasks (41, 42). Researchers should investigate the conditions under which performance is consistent or inconsistent across aspects of sociomoral cognition and behavior.

Concluding Thoughts

Infants' sensitivity to distributive fairness is in some ways commensurate with that of older children and adults. Infants have expectations of fairness and evaluate others based on their fair or unfair behavior. But it also differs in at least one important way: Infants do not appear to spontaneously punish unfair individuals. In this article, I suggested incorporating two approaches to research on infants' sociomoral knowledge. First, researchers should consider how an understanding of fairness, among other highbrow concepts, may ultimately include looking at processes that range from the more basic to the more sophisticated, and should design studies to test for the presence or absence of these processes. Without such an approach, researchers are often forced into an all-or-none position: Either infants possess *all* the knowledge that older children and adults do (with any limits in demonstrating this knowledge chalked up to ancillary deficits) or *none* of this knowledge. Yet it is only by considering how infants and young children may have partial knowledge, what such partial knowledge might look like, and how it can be probed that we can build a developmental picture of the emergence and elaboration of sociomoral cognition and behavior. Second, as others have suggested (43), we can often learn as much from infants' systematic failures as we can from their successes. Indeed, it is the very *conjunction* of infants' successes and failures that provide us with detailed and rich information regarding the nature of early sociomoral representations and how these representations change over time. The pursuit of these two approaches will help us address questions in the field, such as the degree to which sociomoral concerns change conceptually in the transition to childhood.

Acknowledgments

Author's Note

Child Dev Perspect. Author manuscript; available in PMC 2019 September 01.

I thank the postdocs, students, and staff at the Early Childhood Cognition Lab for their assistance in conducting the studies discussed in this article. I am also grateful to the parents and infants who donated their time to participate in these studies. This research was supported by a grant from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NIH RO1-HD076949-01) and a grant from the John Templeton Foundation.

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