The Roots of Moral Reasoning and Behavior in Infants

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Abstract

Recent findings suggest that toddlers and infants engage in prosocial behaviors and evaluate potential social partners based on their morally relevant social acts. Together, this evidence suggests that some foundational aspects of human morality may stem from universal and unlearned features of the human mind. That is, despite the clear role of learning processes in much of moral development, basic motivations to cooperate with and help others, as well as an ability to judge third parties based on their prosocial and antisocial acts, may underlie and constrain those processes. Here, we review the current state of the literature on these topics and point to important remaining issues and future directions.

Inspired by evolutionary theory (e.g., Nesse, 2007; Trivers, 1971), psychologists exploring humans' moral origins have recently begun to find evidence that suggests some aspects of morality may emerge in the absence of morally specific learning inputs, supporting the possibility that some of humans' moral sense is rooted in evolutionary adaptations for social life. This research into the "moral lives" of infants and toddlers (Bloom, 2010), reviewed here, demonstrates their striking sociomoral competencies in three broad domains. These include (i) motivations to engage in *prosocial behaviors*, (ii) a tendency to *evaluate others* based on their pro- and antisocial behaviors, and (iii) the ability to *integrate competencies* (i) *and* (ii), fluidly adjusting their social acts based on previously established evaluations. This research suggests that despite the clear role of learning processes in much of moral development (see chapters in Killen & Smetana, 2014 for recent comprehensive reviews), some foundational aspects of human morality may be universal and unlearned, and may serve to constrain the effects of learning on moral outcomes.

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THE EMERGENCE OF PROSOCIAL BEHAVIOR

Infants and toddlers reliably engage in a variety of behaviors that demonstrate a concern for, and a desire to improve, others' welfare. From birth, infants cry in response to others' cries, but not to sounds matched on various acoustic properties (e.g., Sagi & Hoffman, 1976); this has been interpreted as a rudimentary empathic response. By 8–10 months, infants begin to show a desire to understand the cause of others' distress (Roth-Hanania, Davidov, & Zahn-Waxler, 2011), and 18- to 25-month olds display concern for those who have been harmed even if they are not overtly distressed (Vaish, Carpenter, & Tomasello, 2009). Finally, infants' level of concern for distressed others is positively associated with their tendency to provide comfort in real time (Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992), whereas 14-month olds' active disregard for others is associated with the development of antisocial traits later in life (Rhee *et al*., 2013).

In addition to responding to distress cues, infants also attend to and assist with others' instrumental needs. However, 12-month olds will point helpfully toward an object they know an adult is searching for (Liszkowski, Carpenter, Striano, & Tomasello, 2006), and 14- to 18-month olds actively assist others in a variety of unfulfilled goals (e.g., Warneken & Tomasello, 2006). Providing assistance appears to be intrinsically motivated and rooted in genuine concern for others. For example, toddlers' rate of helping others meet their unfulfilled goals is uninfluenced by whether a parent is in the room (Warneken & Tomasello, 2013a), and those who receive extrinsic rewards for helping subsequently helpless (Warneken & Tomasello, 2008). Finally, rather than being solely based on the emotional cues provided by someone in pursuit of an unfulfilled goal, 12-month olds also provide assistance to those who are *unaware* that they need help, by pointing to alert an individual of a hazardous object in their path (Knudsen & Liszkowski, 2012).

Rather than merely responding to alleviate others' distress or unfulfilled goals, toddlers are prosocial in more "positive" ways as well. For instance, toddlers will in some cases share objects with individuals who have not asked for them (e.g., Hay, Castle, Davies, Demetriou, & Stimson, 1999). These generous acts may be driven by toddlers' finding giving emotionally rewarding: They are happier after giving treats than after receiving them, and are happier still when giving their *own* treats (Aknin, Hamlin, & Dunn, 2012). Together, this growing body of work suggests that infants and toddlers are intrinsically motivated to alleviate others' distress, assist others' needs, and share information and resources.

THE EMERGENCE OF SOCIOMORAL EVALUATION

Even before they are physically capable of engaging in any of the prosocial behaviors identified above, preverbal infants evaluate third parties for their prosocial and antisocial acts, preferring individuals who have acted prosocially to those who have acted antisocially. In these studies, infants are presented with 3-character "morality plays" in which a "Protagonist" demonstrates an unfulfilled goal to climb up a hill, to open a box, or to retrieve a dropped ball (among others; see Figure 1 for schematics of prosocial and antisocial events). The Protagonist's goal is then facilitated by a "Helper" and blocked by a "Hinderer"; subsequently, infants are presented with the Helper and Hinderer side by side and their "preference" is determined by which one they look longer toward and/or touch first.

Infants as young as 3 months of age *gaze longer* toward Helpers than toward Hinderers, and, by the time they can reach reliably, *selectively touch* Helpers over Hinderers (Hamlin & Wynn, 2011; Hamlin, Wynn, & Bloom, 2007, 2010). These preferences do not appear to stem from nonsocial aspects of helping and hindering scenes, given that infants do not prefer characters who direct physically identical "prosocial/antisocial" actions toward nonagents, or toward agents who do not demonstrate an unfulfilled goal (Hamlin, under review; Hamlin & Wynn, 2011; but see Scarf, Imuta, Colombo, & Hayne, 2012). Nor do they stem from preferring those who were associated with better outcomes: 8- to 10-month-old infants evaluate agents based on their mental states, such as whether they *intended* to be prosocial or antisocial (Hamlin, 2013; Hamlin, Ullman, Tenenbaum, Goodman, & Baker, 2013). Like adults, infants evaluate intentionally prosocial and antisocial behaviors in context: 4.5-month olds prefer those who intentionally *hinder* third parties who previously harmed others (Hamlin, 2014; see also Hamlin, Wynn, Bloom, & Mahajan, 2011) and 9-month olds prefer those who hinder individuals who do not share infants' own food preferences (Hamlin, Mahajan, Liberman, & Wynn, 2013).

To demonstrate such preferences, infants must *understand* various aspects of these sociomoral interactions. If infants did not attribute unfulfilled goals to Protagonists, did not recognize the role of Helpers and Hinderers in facilitating and blocking those goals, and/or could not distinguish mentalistic from physical aspects of social behaviors, then they would not be able to distinguish characters as selectively as they do. That said, there has been no evidence in the social evaluation studies reviewed above to suggest that infants *expect* individuals to behave prosocially: Across studies, infants attend equally to prosocial and antisocial acts. This (lack of) attentional pattern suggests that infants' choices of prosocial over antisocial others cannot be attributed to liking those who are more or less familiar after the puppet

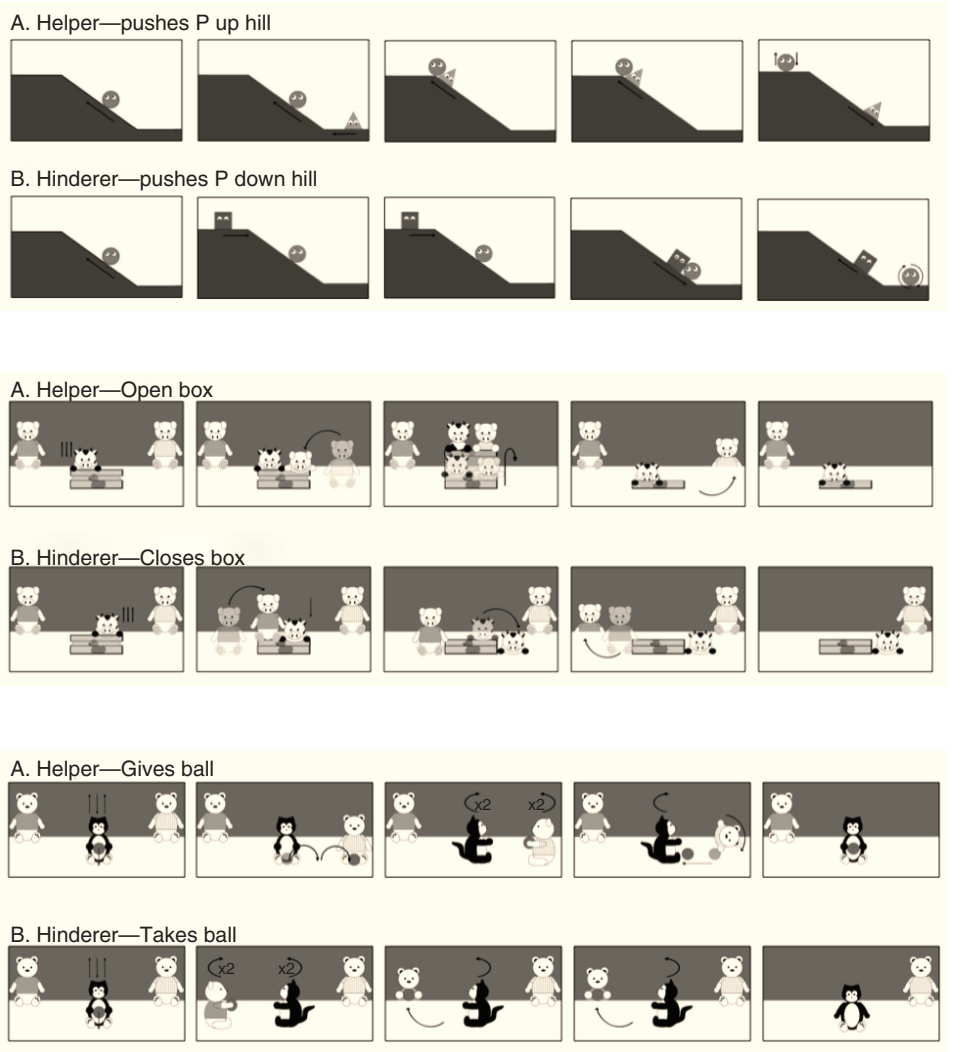

Figure 1 Prosocial and antisocial events shown to infants. Top two rows represent the Hill scenario (used in Hamlin, Wynn, & Bloom, 2007, 2010). Middle two rows represent the Box scenario (used in Hamlin & Wynn, 2011; Hamlin, Wynn, Bloom, & Mahajan, 2011). Bottom two rows represent Ball scenario (used in Hamlin & Wynn, 2011; Hamlin, Mahajan, Liberman, & Wynn, 2013; Hamlin *et al*., 2011).

events or who meet some social expectation versus violate one, providing further evidence that infants' puppet choices reflect sociomoral evaluations.

Despite this, generating notions about the regularities of the sociomoral world is surely critical to optimal moral development, and several studies suggest that infants do develop expectations about some sociomoral interactions by late in the first or early in the second year of life. For instance,

9-month olds look longer when two individuals with opposing preferences interact positively (compared to negatively), but look longer when those with shared preferences interact negatively (compared to positively), suggesting they expect similar others to affiliate positively and dissimilar others not to (Liberman, Kinzler, & Woodward, 2013). In addition, 10- to 13-month olds (but not 8-month olds) expect larger individuals to dominate smaller ones (Thomsen, Frankenhuis, Ingold-Smith, & Carey, 2011; see also Mascaro & Csibra, 2012). In the sociomoral domain of "fair" resource distributions, 15- to 16-month olds attend longer following events in which resources are distributed unequally versus equally between two agents (Schmidt & Sommerville, 2011; Sommerville, Schmidt, Yun, & Burns, 2013). Expectations for fairness may emerge as a result of engaging in prosocial actions oneself: 15-month olds who give away a more desirable object attend longer following unfair than fair distributions, demonstrating sensitivity to fairness, whereas those who give a less desirable object do not (Schmidt & Sommerville, 2011; Sommerville *et al*., 2013). By 21 months, infants' expectations for fairness are sensitive to contextual factors such as the relative effort expended by recipients; if only one agent works to clean up a mess of toys, 21-month olds look longer following *equal* distributions compared to when both work and are given equal amounts (Sloane, Baillargeon, & Premack, 2012). Finally, consistent with their preferences for helpers over hinderers, 16-month olds selectively reach for equal versus unequal distributors (Geraci & Surian, 2011).

Infants also generate expectations about how both recipients and independent observers of prosocial and antisocial acts will behave toward the pro- and antisocial agents. However, 12-month olds predict (measured via their anticipatory eye movements) that recipients of helping and hindering will later approach the Helper versus the Hinderer (Fawcett & Liszkowski, 2012) and distinguish events in which Climbers approach Helpers versus Hinderers (Kuhlmeier, Wynn, & Bloom, 2003). This ability appears to emerge between 6 and 10 months, and is facilitated by the characters having eyes (Hamlin *et al*., 2007). 16-month olds distinguish events when fair versus unfair distributors are approached by an uninvolved observer (Geraci & Surian, 2011), and 10-month olds do so when the approach is accompanied by a positive rewarding action *only* when the observers had visual access to the distributions (Meristo & Surian, 2013). That 10-month olds (in Geraci & Surian, 2011) fail to distinguish events that involve only approaching fair and unfair distributors but (in Meristo & Surian, 2013) successfully distinguish events that involve both approaching and rewarding them could reflect that simple approaches are relatively more ambiguous than are approaches with a clear goal (to reward).

Overall, studies examining infants' looking patterns consistently show that older infants—but in some cases not younger ones—are sensitive to the likelihood of various social interactions following prosocial and antisocial acts, and are even capable of generating predictions about future social acts that have not yet occurred. Younger infants' "failing" in these looking time tasks but "succeeding" at distinguishing helpers from hinderers in forced-choice preference tasks makes some sense, given that generating notions of how others will behave toward third parties may be more cognitively taxing than to prefer a character oneself. More specifically, the employed looking time tasks require infants to assess the mental states of others in order to generate expectations about their social behaviors, which may require infants to inhibit their own evaluations of the characters and/or past experiences with the acts. It remains to be seen whether developing expectations for others' sociomoral acts requires active or observational experience with social interactions in infants' daily lives (see, e.g., Sommerville *et al*., 2013) or whether older infants' relatively more mature abilities stem from some other and as of yet untested domain-general feature of the developing mind. With those caveats in mind, together this body of work demonstrates impressive sociomoral evaluation and sociomoral understanding from quite early in development.

INTEGRATING EVALUATIONS AND BEHAVIORS—PUNISHMENT AND SELECTIVE PROSOCIALITY

An important task of navigating the social world is an ability to *use* social evaluations productively, that is, to adjust one's social behaviors toward potential social partners depending on their past prosocial or antisocial acts. At a broad level, individuals should not only selectively interact with prosocial and avoid antisocial others but also behave in ways that promote others' future prosocial acts and reduce antisocial ones. Because studies of early sociomoral behavior and evaluation involve young and physically immature subjects, research on the development of evaluation-behavior integration is limited. However, a few studies of this sort have been carried out. In one study, 20-month olds who were denied a toy both intentionally (when one adult was teasing them) and unintentionally (when another adult tried but failed to hand them the toy) subsequently helped the unwilling experimenter over the unable one when both reached unsuccessfully for an object. Critically, in a second study in which one adult successfully handed over a toy and a second tried but failed to do so, toddlers did *not* selectively help the able giver, suggesting their selective helping in the first study was in response to the prosocial *intention* of the willing versus unwilling experimenter, and

not an identification of which might successfully help them in the future (Dunfield & Kuhlmeier, 2010). This selectivity is not unique to situations in which toddlers themselves are the targets of prosocial and antisocial acts: 16-month olds emulate or acquire information from those who have treated *others* prosocially but not antisocially (Hamlin & Wynn, 2012), and 21-month olds choose to give resources to prosocial instead of antisocial others but choose to take from antisocial instead of prosocial ones (Hamlin, *et al*., 2011). Notably, when the potential targets of toddlers' giving and taking acts have previously received rather than performed prosocial and antisocial behaviors, more toddlers give a resource to the victim of antisociality than to the beneficiary of prosociality, and more take a resource from the beneficiary than from the victim (see also Vaish *et al*., 2009). Thus, early evaluation-driven social acts appear to reflect more than low level valence-matching wherein positive (or negative) actions are performed toward those previously involved, in any way, in positive or negative acts. Instead, toddlers adjust their social behaviors based on both others' prior prosocial or antisocial actions and prosocial or antisocial experiences, in markedly different ways.

Yet, some studies have failed to find evidence of selectivity in sociomoral behaviors until a year or more later in development than in the studies just described. For instance, Warneken and Tomasello (2013b) found that a partner's previously helping or not helping a child to obtain an out-of-reach object did not affect whether children (at either age 2.5 or 3.5) helped that individual in return, and it was not until age 3.5 that toddlers preferentially shared with a partner who had shared with them. In a study in which 16- to 27-month olds observed prosocial/antisocial acts directed at third parties, only the oldest toddlers selectively helped those who had helped versus hindered (Dahl, Schuck, & Campos, 2013), and when 3- and 4.5-year olds were given 3 biscuits to distribute between Helpers and Hinderers, only 4.5-year olds tended to give the last biscuit to the Helper (Kenward & Dahl, 2011). Such conflicting results suggest that an important future task will be to clarify in which domains, under which circumstances, and at what point in development evaluation-behavior integration occurs.

In sum, recent research suggests that the sociomoral capacities of infants and toddlers are well beyond what has been attributed to them in traditional theories of social and moral development. Although this research is not without its critics (see, e.g., Scarf *et al*., 2012), even the possibility that infants have any sort of moral life represents a significant change from previous decades. Still, the research itself is just in its infancy, and much about the ontogenesis of humans' sociomoral sense remains to be explored. The last section

of this essay will pursue a few of the many questions remaining for future research.

FUTURE DIRECTIONS

What Is the Role of Emotion in Infants' Sociomoral Evaluations?

Whether moral judgment is fundamentally "cognitive" or fundamentally "emotional" has divided moral theorizing at least since the Enlightenment. Although the role of emotion in motivating prosocial behavior in toddlers is well documented (see section a), most research into the development of moral judgments has traditionally taken a cognitive approach (e.g., Kohlberg, 1969). However, the argument that emotional processing is critical for moral judgments has recently been gaining empirical support in adults and children (see, e.g., Haidt, 2001; Rottman & Kelemen, 2012), and infant-onset lesions to brain regions supporting emotional processing negatively impact the development of *both* moral behavior and moral reasoning later in life (Anderson, Bechara, Damasio, Tranel, & Damasio, 1999; Taber-Thomas *et al*., 2014). With this evidence in mind, an interesting avenue for future research will be to determine whether infants' social evaluations are better conceived of as "computationally cold," cognitive judgments (akin to "1 + 1 = 3 is incorrect") or "computationally hot," emotional ones (akin to "when I see hindering I feel badly").

Whether emotion plays any role in infants' sociomoral evaluations could be explored in various ways. One possibility would be to simply measure babies' emotional reactions immediately after they observe both prosocial and antisocial acts and examine whether they react differently to each type. If so, one could examine whether infants who express stronger/weaker emotional reactions to prosocial and antisocial behaviors show more/less robust social evaluations. Such a methodology would be merely correlational, and so would not reveal whether infants' emotional experiences *cause* their social evaluations or the other way around; however, identifying a relationship between infants' emotional reactions to the third party social interactions they observe and their tendency to prefer Helpers to Hinderers would at least serve to bolster claims that infants puppet choices reflect true evaluations. An alternative method might involve *inducing* emotion in infants during their observation of prosocial and antisocial events. If emotions play some causal role in infants' evaluations, then inducing a valence-consistent emotion (positive emotion during prosocial events, negative emotion during antisocial events) should make infants' evaluations stronger, whereas inducing a valence-inconsistent emotion should disrupt them.

Are Demonstrations of Sociomoral Action and Evaluation in Infants and Toddlers Ecologically Valid?

Many of the experiments and studies reviewed previously were conducted in the lab, and thus it is worth asking how generalizable these findings are. First, infants are always strongly encouraged to act (versus not act) by placing them in scenarios where they are likely to make a behavioral response, in which there is often only one of two possibilities (i.e., infants are put into a "forced-choice" paradigm); it is unclear whether they would act similarly under other circumstances. Second, many of these studies (particularly those examining infants' evaluations) employ puppets or animated shapes as their stimuli, thus it is worth keeping in mind that much of the time, infants' evaluations have not been tested using humans as the agents (but see, e.g., Dunfield & Kuhlmeier, 2010 for positive results using human agents). In addition, in social evaluation experiments, infants are typically shown the same prosocial and antisocial acts over and over again in order to ensure sufficient processing, whereas the real social world does not regularly provide playbacks of others' nice and mean behaviors. Indeed, outside of the laboratory infants presumably see individuals engaging in *both* prosocial and antisocial behaviors toward the same target, given that minor contextual nuances (many that infants presumably cannot perceive) influence whether most behaviors should be considered nice, mean, or neither one. For instance, infants may see an older sibling be given food by a parent in one context (such as during dinner) and have food taken away in a different context (such as when he or she is eating too many sweets).

The disconnect, then, between the ways in which infants have been tested in the lab and the nature of real social interactions may mean that we know less about infants' *actual* sociomoral lives than we may suspect. This is not to say that the research reviewed herein is uninteresting or unimportant, and it surely represents a "proof of concept" whereby, given sufficiently supportive contexts, infants *can* help others, share resources, tell the good guys from the bad guys, and punish appropriately. Perhaps nascent forms of these behaviors and evaluations do occur in infants' daily lives as infants actively learn, refine, and incorporate different social systems together early in development; this may prepare them to adequately deal with the social world during childhood and beyond. On the other hand, perhaps everyday social interactions are too complex, too opaque, or happen too fast for infants to process them, and their nascent prosociality is trumped by other, self-oriented motivations. Much more research is needed to achieve a thorough understanding of the ecological realities of sociomoral development from infancy.

Do Individual Differences in Infants' Sociomoral Performance Predict Important Outcome Variables Later in Development?

While researchers are increasingly exploring individual differences surrounding the development of pro- or antisocial *behaviors* (e.g., Rhee *et al*., 2013), studies of infants' social *evaluations* are by and large studies of the "average" infant, whereby if many infants prefer prosocial characters or predict that others will too, it is concluded that *all infants* can do so, at least most of the time. Indeed, given that the great majority of infants respond similarly, and that there are a multitude of reasons (such as sleepiness or hunger) why any one infant might not perform as predicted on a given day, this might be an accurate assumption. That said, recently researchers have begun to probe whether there are meaningful *individual differences* in tasks of infant social cognition that predict later social functioning. For example, the speed at which infants habituate to a social interaction predicts their Theory of Mind development (broadly, the ability to consider others' thoughts as separate from one's own and from reality) at age 4 (Wellman, Lopez-Duran, LaBounty, & Hamilton, 2008), as do individual differences in looking time to expected versus unexpected social interactions (Yamaguchi, Kuhlmeier, Wynn, & vanMarle, 2009). Interestingly, the latter study suggests that the relationship between infant cognition results and later Theory of Mind is domain specific: Infants' performance in a nonsocial domain did not predict their later Theory of Mind. A noteworthy avenue for future research, then, might be to explore how or whether individual differences in performance on sociomoral evaluation tasks in infancy predict later sociomoral functioning. Do infants who consistently choose antisocial others, for example, show different patterns of moral development than those who choose prosocial ones? Exploring these possibilities might shed light on very early risk factors for the development of various social and moral developmental disorders.

CONCLUSION

Although much remains to be uncovered, the extant findings on sociomoral development within the first 2 years of life nevertheless demonstrate some very early emerging foundations for certain aspects of human morality, which may act to constrain subsequent moral development. Because of these young (and in many cases, preverbal) babies' very limited opportunities to learn such foundations from experience in the world, this research suggests that—as proposed by evolutionary biologists and psychologists—the moral mind does not begin a blank slate, and that humans likely possess some universal adaptations for social living. Still, many questions remain, only a

few of which we have outlined here; we hope that this review will inspire research into these exciting new directions.

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