

Early Social Cognition

How Psychological Mechanisms Can Inform Models of Decision Making

Felix Warneken and Alexandra G. Rosati

Abstract

Many approaches to understanding social decision making use formalized models that account for costs and benefits to predict how individuals should choose. While these types of models are appropriate for describing social behavior at the ultimate level—accounting for the fitness consequences of different patterns of behavior—they do not necessarily reflect the proximate mechanisms used by decision makers. It is argued that a focus on psychological mechanisms is essential for understanding the causes of decision making in a social context. Focus is on the behavior of human children to elucidate the psychological capacities that are foundational for the developmental emergence of social decision making in humans. In particular, evidence is presented across a wide range of contexts to indicate that young children appear to focus on the underlying psychological states of potential social partners in cooperative contexts. This suggests that many types of social decisions may be driven by intention attribution, not explicit utility calculations. It is proposed that a comprehensive theory of social decision making must address both questions about ultimate function as well as integrate empirical studies of the psychological instantiation of these processes. Developmental approaches are particularly informative, as they elucidate the origins of decision making as well as the factors that shape them into their mature form seen in adults.

Introduction

How do humans (and other animals) behave in social contexts? This fundamental question is relevant both in the biological and social sciences, and many different disciplines have attempted to address this question through theoretical models of behavior and experimental inquiries. Research traditions in economics and biology, in particular, have utilized formalized models from game theory to understand social behavior (Hammerstein and Hagen 2005). These

models describe social behavior as a series of decisions between multiple options as social actors attempt to sort out an optimal course of action. In evolutionary biology, these models are often used to describe behavior at an ultimate level of analysis; from this perspective, social decisions are evaluated in terms of fitness benefits, so value can be differentially assigned to different types of social interactions or behavioral strategies in terms of how these behaviors impact reproductive success in the long term. In economics and other social sciences, such models are used both to explain behavioral outcomes and to elucidate the psychological processes in which social agents engage. The underlying assumption of many of these approaches is that people use a function of expected utility, or some internal measure of “goodness” or desirability of various options (Fehr and Camerer 2007). For example, recent neuroeconomic approaches have integrated economic and neurobiological models to form a physiological utility theory—the hypothesis that some desirability function is computed in the brain (e.g., Glimcher et al. 2005). However, even if the behavioral outcomes of social decisions could be described in these terms (i.e., if people computed the expected utility of different social outcomes), whether such utility calculations actually reflect the processes going on in the minds of individuals remains an open question. That is, even if evolution acts on a value-based currency (fitness), this does not necessarily mean that decision makers actually employ these sorts of utility computations when making social decisions. Similar examples of divergence between ultimate and proximate levels abound in biology. For example, while kin selection at the ultimate level hinges on the degree of relatedness between social partners, individuals appear to use cues such as physical similarity (phenotypic matching) or early familiarity to decide how to interact with others (Widdig 2007). They do not actually calculate genetic relatedness, but rather use a set of proxies that are easily detectable to recognize kin. Consequently, in the domain of social decision making it is critical to investigate the actual psychological mechanisms that individuals use. These will then provide important insights at a proximate level of analysis into the behavioral goals that humans and other animals are attempting to reach.

In this chapter we examine to what extent utility-based models can capture the essence of how humans make social decisions at the proximate level. We propose that while such models of decision making may be appropriate to describe social behavior at an ultimate level, these types of analysis may not be as useful when examining the diversity of actual motivators that drive behavior. We claim that at its core, social decision making depends on representations of the psychological states of other social agents. In particular, we claim that humans do not appear to engage in value calculations in many social contexts but are instead primarily attuned to the intentions, dispositions, and motivations of social partners. This can already be witnessed in young children, who represent others’ actions in terms of psychological states (especially intentions) and not just concrete behavioral outcomes for themselves and others. Thus,

representing social interactions in terms of the psychological states of partners may be an adaptive way to make social decisions. This type of social cognition can occur in the absence of utility calculations or even concrete payoffs in a given situation, yet it still may have important long-term fitness consequences. For example, even if no significant resources are at stake during the decision-making process itself, displaying cooperative intentions and detecting others who possess cooperative dispositions might lead to long-term beneficial outcomes through positive assortment (McNamara et al. 2008).

We present evidence to support our claim that many types of social decisions hinge on intention reading, understanding of social relationships between individuals, and attribution of dispositional traits to potential social partners. We focus on the basic capacities that are already present in young children, as these provide the foundation for further social interaction and ontogenetic development more generally. In particular, we examine three types of social problems which we claim pose unique demands on decision makers relative to nonsocial choices. First, we examine how children detect opportunities for cooperation during social interactions. How do children decide whether or not to have a social interaction at all? In contrast to many economic tasks, in more naturalistic contexts actors do not face particular cooperative situations with predefined roles, but rather must infer that the opportunity for payoffs even exists and engage potential partners. Second, we examine how children identify appropriate social partners for various cooperative activities. We emphasize the importance of partner choice models of social decision making (McNamara et al. 2008; Schino and Aureli 2010), here based on attributions of psychological traits to others. Finally, we examine the roots of how young children form enduring social bonds with good partners. More broadly, how do children decide who should be their friend or long-term cooperative partner? The formation and maintenance of long-term bonds is a serious social problem for gregarious animals like humans, and the psychological processes that support these relationships may be very different from those recruited in more short-term interactions.

Models of Social Decision Making

Traditional economic theory assumed that humans make social decisions much like they make nonsocial decisions: by focusing on one's own potential payoffs. These types of analyses derive from game theoretic models and operate under the assumption that rational actors will decide based on their own self-interest. However, experimental studies have revealed that humans often do not choose in accordance with these models. These studies typically involve economic tasks in which subjects engage in a social interaction with a predefined structure and a concrete set of behavioral alternatives (described in terms of financial payoffs for the self and others). Tasks including the ultimatum game,

trust game, and the prisoner's dilemma create structured interactions with quantifiable social payoffs in a similar fashion. However, although classical predictions suggest that proposers should act to maximize their own payoffs in these contexts, experimental studies have revealed that humans often exhibit "social preferences." That is, their choices do not depend only on their own payoffs, but also integrate a concern for the welfare of others. For example, people may have a motivation to behave altruistically (Andreoni 1990), be concerned about the equity of the final payoff distribution (Fehr and Schmidt 1999), or may be motivated by fairness and reciprocity: wanting to be kind to nice people and unkind to mean people (Rabin 1993).

As such, newer models also assume that social decision making involves utility comparisons, but they differ in that they assign additional value to certain types of social outcomes (Levine 1998). Different models also vary in how this "social utility" is calculated. Some consequentialist models focus on the final distribution of payoffs alone; whether or not someone is "kind" could be evaluated simply by comparing two partner's outcomes to assess whether they are equitable (Fehr and Schmidt 1999). Other economic models, in contrast, emphasize the importance of intention reading in social decision making. For example, people appear to account for the intentions of their partner when choosing whether or not to accept an offer in the ultimatum game (Falk et al. 2003). Accumulating evidence from neuroeconomics further supports the importance of intention reading in social decision making (Delgado et al. 2005; Sanfey et al. 2003). Importantly, however, even in models that emphasize intention reading, the underlying social cognitive skills are often viewed as an "input" to the broader utility calculation. That is, intention reading is used to assess how valuable different courses of actions would be, and it is this value assessment which actually drives the decision maker's choices. For example, in one model of reciprocity (Falk and Fischbacher 2006), another player's "kindness" is represented as a function of the outcome distribution and an "intention factor" (whether the other player's actions were intentional or not in causing this distribution). As such, the desirability of a given outcome is modified by the intentions of the other player—a bad outcome is not so bad if he didn't do it on purpose!—but a utility calculation still lies at the heart of the behavioral decision. However, most social interactions do not involve concrete payoffs explicitly assigned to a particular choice. Thus, a critical question is: How do humans act when they are faced with social problems that are not easily described by such models? What happens when the costs and benefits are not quantifiable (either in an absolute sense, or in terms of the relative value for the different participants) or, more importantly, when the costs and benefits are potentially quantifiable, but are not readily apparent to the individuals involved?

Studies of social-cognitive development can fill this void, as such studies often examine cooperative situations that are ubiquitous and pervasive in everyday life, but may not be easily captured by game theoretic approaches. Thus, examining the cognitive skills that humans use in such situations can

help identify the way people make social decisions more broadly. We focus in particular on social cognition because it is essential for our lives as social animals, most prominently captured in the *social intelligence hypothesis* (Dunbar and Schultz 2007; Humphrey 1976; Jolly 1966). The uses of social cognitive capacities to attribute intentional states to other agents are manifold, including the domain of cultural learning and the attempt to outsmart others in competitive encounters. Here we focus on the social-cognitive capacities which underlie our ability to cooperate with others in various ways, structured by the three main tasks that social agents face: the decisions to cooperate when, with whom, and with whom over the long term. We show that many of the social-cognitive capacities have roots early in ontogeny, highlighting their foundational role for the development of social interaction.

Social Cognition in Young Children

Humans are sensitive to cues of intentional action from early on in development. Infants already begin to look behind the surface of people's behavior, quickly developing the ability to represent actions in terms of goals and intentions rather than mere behavioral outcomes alone. The rudiments of this developing capacity can be seen in 6-month-old infants: when they observe the simple action of a hand grasping different objects, they selectively encode the goal object of the agent's reach rather than the spatiotemporal movement of the other's hand (Woodward 1998). Infants also seem to represent the most efficient means to achieve a goal, taking into account the situational constraints of an agent's action (Gergely et al. 1995). Last but not least, young children are able to differentiate between intentions from behavioral outcome, distinguishing between situations in which a person is either unwilling to hand them a toy (such as offering but then withdrawing a toy in a teasing manner) or unable to provide the toy (trying but failing because it slips out the agent's hand). Thus, even if the outcome is the very same—the child does not receive a toy—infants are responsive to the different intentions leading to this outcome (Behne et al. 2005). Similarly, young children selectively imitate those aspects of an action that a person did on purpose over those which happened by accident (Carpenter et al. 1998; Nielsen 2009) or as a result of some behavioral constraint (Gergely et al. 2002). Finally, young children can infer what a person was attempting, even if they never saw the outcome that the person was trying to achieve (Meltzoff 1995; Nielsen 2009). Taken together, these studies show that from an early age, children seem to represent not only observable outcomes of behavior, but rather they try to understand the psychological processes driving the behavior. This helps children not only in discovering new ways for interacting with the physical world, but also how to interact with others socially. We now examine how these developing abilities to represent other's behavior, in terms of underlying psychological states, impact social decision making.

How Do Children Detect Opportunities for Social Interactions?

In contrast to existing experimental tasks derived from game theory, in more naturalistic contexts children do not face well-defined social choices with pre-defined outcomes. Rather, they must infer that the opportunity for an interaction even exists and engage potential partners as appropriate. Children's emerging social-cognitive capacities are therefore critical for enabling them to recognize when the opportunity to cooperate has arisen. This becomes apparent in two classes of cooperative behaviors: helping and collaboration. In helping, one individual is acting on behalf of another person's need or problem (potentially driven by altruistic motivations), whereas in collaboration, social partners act collectively to produce a mutually beneficial outcome. Importantly, the behavior that children exhibit in many of these contexts may not be that mysterious from a game-theoretic perspective; for example, the benefits provided may be mutualistic and thus the motivation to engage in such behaviors may be clear at an ultimate level. However, children would not be able to engage in these various behaviors without sophisticated social-cognitive skills in the first place. That is, the way in which children detect (and create) opportunities for cooperation is based on their ability to infer goals and intentions from observing other's actions. More specifically, these types of cooperation may be based on two different kinds of social cognitive representations: the ability to represent individual intentions as a prerequisite for helping behaviors and the ability to form joint intentions with a social partner in collaborative activities.

Concerning helping behaviors, from early on in their lives children are able to help in various contexts with different kinds of problems that require different types of intervention. Specifically, toddlers spontaneously help unfamiliar individuals in a variety of contexts, including handing over objects that a person dropped accidentally, removing obstacles that block another person's path, producing the desired outcome even if they never witness a successful completion of the task, opening a novel box if the other person fails, or pointing to the location of a misplaced object for which another person is searching (for an overview, see Warneken and Tomasello 2009). In these situations, children use their intention-reading capacities to detect whether the person has succeeded with her goal and help is needed or not. Second, the variety of situations in which children are able to help highlights that children utilize social-cognitive capacities to help flexibly. Importantly, an altruistic motivation to help other people may ultimately benefit kin, be part of a reciprocal exchange, or contribute to the success of the group. However, these actions would not be possible without the social cognitive capacity to read intentions which vastly increases the opportunities for cooperative behavior.

Young children not only act for others to achieve individual goals, they also act with others collaboratively to achieve joint goals. This enables individuals to produce outcomes that lie beyond the means of any one individual. However, collaboration can require fairly sophisticated behavioral and psychological

capacities, as individuals must recognize the potential for a mutualistic situation and be able to act jointly to some degree to benefit mutually. For example, humans may have the unique ability to form joint intentions, a specific cognitive representation that includes a representation of the partner's actions and their interrelationship (Tomasello et al. 2005). Briefly put, participants of a joint collaborative activity represent their own and the partner's action as part of a joint plan of action, including the commitment to coordinate their mutual actions in pursuit of the joint goal. Developmental research shows that during the second year of life, children begin to collaborate successfully with others: first with adults, and somewhat later with peers (Brownell et al. 2006; Eckerman and Peterman 2001; Warneken et al. 2006; Warneken and Tomasello 2007). This includes problem-solving tasks that involve complementary roles to retrieve a reward, as well as social games in which two individuals coordinate with no external goal. Several studies indicate that children not only adjust their behaviors to that of the partner on a superficial level, but seem to grasp the joint intentional structure of these activities.

There are three pieces of evidence in favor of this claim: First, young children engage in role-reversal, flexibly switching between two complementary actions (Carpenter et al. 2005). Second, 18-month-old children do not just follow the partner's lead, but actively participate; when an adult partner interrupts the joint activity, children often try to reengage the partner (Warneken et al. 2006). Importantly, children respond differently to a partner who interrupted because she was either unwilling or unable to continue; this demonstrates that they do not simply respond to the behavioral outcome (partner does not act), but rather the reasons behind this inaction (Warneken et al. 2012). Finally, children appear to form joint commitments to collaborate. From around three years of age, children are more likely to try to reengage a person after their joint commitment to collaborate together ("Let's play!") than when no such commitment existed and both individuals just play in parallel (Gräfenhain et al. 2009). Joint intentions impact payoff distributions as well, as peers are more likely to help and share obtained rewards as part of a collaborative activity rather than individual problem solving (Hamann et al. 2011, 2012). Taken together, these studies demonstrate that when children engage in joint tasks, they do not simply focus on mutualistic outcomes but conceive of self and other as genuine collaborative partners, who have the intention to act collectively toward a joint goal in a committed fashion. Thus, while many collaborative tasks involve mutualistic benefits, children would not necessarily be able to realize the mutualistic opportunity was present without their emerging social-cognitive skills.

How Do Children Identify Appropriate Social Partners?

Social agents must not only be able to decide when to cooperate, but also with whom. This raises the question of what kind of information guides the

decisions that children make as developing cooperators. We distinguish two classes of information that can serve as the basis for this decision: children's previous direct interaction with potential social agents and their observation of third parties interacting with each other. Once again, evidence is accumulating that when deciding with whom to cooperate, young children are attentive to and perhaps even prioritize information about another person's intentions over the mere behavioral outcome of a cooperative interaction.

Concerning direct social interaction, research shows that two-year-olds tend to help "nice" people over "mean" people. Specifically, children interacted with a person who was unwilling to give them a toy as well as another person who failed to do so because she was unable. After the interaction, children tend to help the previously unable individual over the unwilling individual, even if they had not received a toy from either person (Dunfield and Kuhlmeier 2010). Similarly, children also prefer to help someone who handed them a toy intentionally compared to a person who transferred a toy to them as a kind of side effect of their action, even though the outcome was again the same. Finally, when children are confronted with a person who successfully handed over a toy and another person who tried but failed, they are indifferent in their subsequent helping; this indicates that beneficial outcome does not necessarily trump good intentions (Dunfield and Kuhlmeier 2010).

Children can also learn about potential social partners from the observation of third-party interactions. Before their first birthdays, infants differentiate between "helpers" and "hinderers" in short animations (where agents either facilitate or obstruct another agent's path up a hill) and expect the helpee to approach the helper over the hinderer (Kuhlmeier et al. 2003). The fact that these infants form expectations about behavior that carry across different contexts indicates that they might attribute dispositions to these agents. Moreover, not only do infants differentiate these events and draw inferences, they display a preference for the helper over the hinderer, as measured by their approach (Hamlin et al. 2007). Toward middle childhood, these social evaluations then begin to guide their own cooperative behaviors. For example, three-year-olds selectively direct their helping toward "nice" people, based on their assessment of how others had previously interacted. In one study, children preferentially helped a neutral person over a person who had previously harmed another individual; they even show this preference when harm was intended but not actually realized (Vaish et al. 2010a). That is, the intentions underlying the observed behavior are particularly important, and children use this information to cooperate selectively with specific individuals. These results are corroborated by more explicit measures of children's judgment, with 3.5-year-olds advising that a character should share more with those who previously shared reciprocally, and should preferentially share with others who had shared with third parties (Olson and Spelke 2008).

Why might children focus on the underlying intentions of different potential social partners, even sometimes to the exclusion of the actual outcomes they

received with those partners? One possibility is that intentions are a better predictor of future behavior than are payoffs, assuming that intentions underlying a behavior are more stable than the behavioral outcome which is influenced by situational factors (Fishbein and Ajzen 1975). For example, someone who struggles (but fails) to cooperate may be a better bet for future interactions than someone who just happened to create a positive outcome without any sign that this resulted from genuine cooperative intentions. Thus, although at the proximate level children may not be calculating a utility associated with interacting with different partners, at the ultimate level focusing on intentions may serve as good proxy for identifying the most advantageous partners. This suggests that children should perceive cooperative intentions in others as a stable trait that persists over time. Next we examine the evidence concerning whether children actually use their social-cognitive skills to attribute personal characteristics to others in this way.

How Do Children Maintain Enduring Bonds with Good Partners?

Social agents living in stable social groups do not have to decide anew each time whether another individual is an appropriate social partner or not. Individuals interact with many other social agents over repeated encounters and thus form social bonds and animosities which shape social decision making over longer time frames. Humans expect other agents to act consistently over different social encounters and different situations, attributing dispositions as enduring traits that are expressed across multiple behaviors. Young infants already seem to attribute dispositions rapidly to agents, extrapolating from one context how agents will act in a different context. This is evidenced by studies that examine helpers and hinderers (Kuhlmeier et al. 2003): when 12-month-old infants observe one agent acting as a hinderer and another agent acting as a helper when an agent is trying to travel up a hill, they can extrapolate from one type of situation to another both to predict how others will act and use this information to decide with whom they should interact. This phenomenon is also reflected in tasks used with three-year-olds who, after witnessing how one person was mean to another person, are then less likely to help the mean person than the unfamiliar person with an allegedly clean record (Vaish et al. 2010a). Thus, children seem to attribute enduring characteristics to other agents that transcend the immediate context or situation.

These abilities are potentially important for the decisions that children need to make in real life to determine with whom they should interact repeatedly. Indeed, children develop enduring relationships with people outside their family early in life. From at least three years onward, children differentiate between friends and non-friends, preferentially interacting with certain peers over others (Rubin et al. 2005). When interacting with friends, they show more positive and more elaborate social behaviors, including cooperation and social games (Hartup 1996; Rubin et al. 2005). Interestingly, episodes of conflicts

and even aggression are more likely to occur among friends than non-friends, with the crucial difference that friends are also more likely to resolve these conflicts than non-friends, settling things—as the word already implies—amicably. Finally, friendship relations mediate the specific decisions that children make in cooperative contexts as well. Three-year-old children suggest that friends should give more to each other than agents who are strangers to each other (Olson and Spelke 2008), and they are more likely to share with friends than with non-friends when it involves an actual cost to themselves (Moore 2009). Moreover, when children enter school, they begin to show parochial tendencies, acting more generously toward in-group members than out-group members (Fehr et al. 2008a). Thus, children are prepared not only to decide on the fly with whom to cooperate or not, they encode information about more enduring traits of individuals which transcend the interpretation of behaviors as single episodes and interpret them instead as expressions of dispositions underlying other people's acts.

The Evolution of Social Decision Making

Can this view of the development of human cooperation be extended to encompass a more general explanation of social decision making across species? The social world has long been thought to be a major force shaping cognition, especially in primates (Byrne and Whiten 1988; de Waal 1982; Jolly 1966). More recently, empirical investigations suggest that at least some species of primates possess social-cognitive skills mirroring those seen in young children (Rosati et al. 2010), including intention-reading skills (Call et al. 2004; Phillips et al. 2009). While many of these empirical investigations of primate social cognition have focused on competitive contexts, the basic thesis that primates' sophisticated cognitive abilities evolved for a social function also encompasses cooperative contexts. For example, wild chimpanzees engage in several complex cooperative behaviors including meat sharing, group hunting, mate guarding, and boundary patrols (Muller and Mitani 2005). Thus, a major question for generalizing our view of human social decision making is whether social-cognitive factors, including intention reading, are also a major determinant of cooperative interactions in nonhumans.

Several lines of empirical evidence address this question. First, apes know the quality of the relationships they share with group-members: chimpanzees will spontaneously cooperate to acquire food in a mutualistic task with conspecifics with whom they share a tolerant relationship, but not with intolerant partners (Hare et al. 2007; Melis et al. 2006b). Similarly, some types of cooperative behavior (such as helping) appear to be driven by intention cues from the recipient, as in human children, not the expectation of explicit rewards (Melis et al. 2010; Warneken et al. 2007; Warneken and Tomasello 2006). Second, chimpanzees appear to engage in selective cooperation, like human children,

using their social-cognitive skills to identify appropriate social partners. In particular, they prefer skillful partners over unskillful partners (Melis et al. 2006a) as well as those who cooperated with them in the past over those who did not (de Waal and Luttrell 1988; Koyama et al. 2006; Melis et al. 2008). Chimpanzees also use information about whether a conspecific was the cause of them losing food access when deciding whether to punish (Jensen et al. 2007b). Finally, many species of primates appear to engage in reconciliation to maintain long-term bonds with good social partners (de Waal 2000), in some cases using their social knowledge about the relationships of others (Wittig and Boesch 2010). While it is not clear for all cases how “deep” the attributions of psychological states reach, animals are likely using attribution of agency or even intention reading when making social decisions.

This type of social-cognitive analysis also suggests that some forms of social-decision making may be limited to humans—not because other primates would not potentially benefit from the interactions, but because they lack the opportunity to detect potential cooperative opportunities. For example, while chimpanzees do engage in helping behaviors, they appear to depend on overt goal cues—such as reaching or attempting to enter a room—much like very young children at 14 months (Warneken and Tomasello 2007). By 18–24 months, however, children can already engage in flexible helping across a diverse set of contexts, involving goals that are likely more complex to understand (e.g., placing items in particular locations or failing to open a container with the correct method). In addition, there is currently no evidence that chimpanzees form joint intentions when engaging in mutualistic interactions in the way that young children do (Greenberg et al. 2010; Hamann et al. 2011; Melis et al. 2010). This suggests that chimpanzees may miss out on potential opportunities for beneficial social interactions because they lack the cognitive ability to detect that the opportunity is present.

In general, children’s developing social-cognitive abilities suggest three main ways in which intention reading might be a good psychological strategy from an ultimate perspective, relative to utility-based models of psychological processes. First, when payoffs are not explicitly defined, intention reading might be the most salient cue for detecting opportunities to cooperate. Individuals who are skillful at reading other’s intentions might therefore have the best behavioral outcomes, because they have successful cooperative interactions (including mutualistic interactions) whereas others who do not engage do not. Second, intention reading may be a good proxy for predicting good social partners. Utility-based models often require previous behavioral experiences with a partner to assess the desirability of different courses of action. In contrast to repeatedly engaging in costly interactions with another individual to learn whether they are a good partner, assessing cues to another’s intentions can allow decision makers to find good partners more cheaply. Finally, individuals can use social cognitive skills to assess other individuals’ enduring behavioral patterns, differentiating between those who are likely to be a friend or foe.

Conclusion

Different research traditions have approached similar phenomena from different ends, either beginning with the potential fitness costs and benefits of social behaviors, or starting with the psychological processes involved in social decision making. Looking at concrete payoffs and ultimately fitness consequences is important to understand behavior in terms of its evolutionary significance; however, the psychological relevance of payoff is still unclear. This highlights the difficulty of connecting the analysis of ultimate function and proximate mechanisms. What we are facing could be called “Tinbergen’s fifth question.” That is, how do we connect the four questions of biology that Tinbergen (1963) identified, especially ultimate function (“survival value”) and proximate mechanisms (“causation”)? We have provided examples of the psychological capacities that enable agents to navigate the social world, focusing on the basic capacities seen in young children. We suggest that social decision making is social in a deep sense, not only as a decision about other social agents but about their agency itself, because humans pay particular attention to intentions as causes of other people’s behavior. Many of these capacities can be traced back into early ontogeny, which highlights the foundational role that they must play in the development of social decision making.

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