Early Moral Cognition: A Principle-Based Approach

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Abstract

There is considerable evidence that beginning early in life, abstract principles guide infants' reasoning about the displacements and interactions of objects (physical reasoning) and about the intentional actions of agents (psychological reasoning). Recently, developmental researchers have begun to explore whether early-emerging principles also guide infants' reasoning about individuals' actions toward others (sociomoral reasoning). Investigations over the past few years suggest that at least four principles may guide early sociomoral reasoning: fairness, harm avoidance, ingroup support, and authority. In this chapter, we review some of the evidence for these principles. In particular, we report findings that infants expect individuals to distribute windfall resources and rewards fairly; they expect individuals in a social group to help ingroup members in need, to limit unprovoked and retaliatory harm toward ingroup members, to prefer and align with ingroup members, and to favor ingroup members when distributing limited resources; and they expect an authority figure in a group to rectify transgressions among subordinate members of the group. Together, these findings support prior claims by a broad cross-section of social scientists that a small set of universal principles shapes the basic foundation of human moral cognition, a foundation which is then extensively revised by experience and culture.

Introduction

Beginning in the first year of life, infants attempt to make sense of the world around them. How do they do so? A major hypothesis in developmental research has long been that in each core domain of causal reasoning, a skeletal framework of abstract principles and concepts guides how infants represent and reason about events (Gelman, 1990; Leslie, 1995; Spelke, 1994). Initial investigations focused on infants' *physical reasoning* and found that principles of gravity, inertia, and persistence (with its corollaries of solidity, continuity, cohesion, boundedness, and unchangeableness) constrain early reasoning about objects' displacements and interactions (Baillargeon, 2008; Luo, Kaufman, & Baillargeon, 2009; Spelke, Phillips, & Woodward, 1995). Thus, even young infants realize that an inert object cannot remain suspended when released in midair (gravity), cannot spontaneously reverse course (inertia), cannot occupy the same space as another object (solidity), and cannot spontaneously disappear (continuity), break apart (cohesion), fuse with another object (boundedness), or change into a different object (unchangeableness).

Next, researchers turned to infants' *psychological reasoning* (also referred to as mental-state reasoning or theory of mind). Investigations revealed that when infants observe an agent act in a scene, they attempt to infer the agent's mental states; these can include motivational states (e.g., intentions), epistemic states (e.g., ignorance), and counterfactual states (e.g., false beliefs) (Gergely, Nádasdy, Csibra, & Bíró, 1995; Luo & Baillargeon, 2007; Onishi & Baillargeon, 2005). Infants then use these mental states, together with a principle of rationality (and its corollaries of consistency and efficiency), to predict and interpret the agent's subsequent actions (Baillargeon, Scott, & Bian, 2016; Gergely et al., 1995; Woodward, 1998). Thus, if an agent wants a toy and sees someone place it in one of two containers, infants expect the agent to reach

for the correct container (consistency) and to retrieve the toy without expending unnecessary effort (efficiency).

More recently, researchers have begun to study infants' *sociomoral reasoning*. Initially, it appeared as though the skeletal framework in this domain, unlike those in the previous two domains, might involve no principles. In particular, infants seemed to hold no expectations about whether individuals would refrain from harming others or would help others in need of assistance. In a series of experiments, infants ages 3–19 months were presented with various scenarios depicting interactions among non-human individuals (e.g., different blocks with eyes; Hamlin, 2013, 2014; Hamlin & Wynn, 2011; Hamlin, Wynn, & Bloom, 2007, 2010; Hamlin, Wynn, Bloom, & Mahajan, 2011). Each scenario involved two events: a *positive* event, in which a nice character acted positively toward a protagonist (e.g., rolled a dropped ball back to the protagonist or helped the protagonist reach the top of a steep hill), and a *negative* event, in which a mean character acted negatively toward the same protagonist (e.g., stole the ball or knocked the protagonist down to the bottom of the hill). Across ages and scenarios, infants looked equally at the two events, suggesting that they detected no violations in the negative events and hence that they did not expect the mean character to either refrain from harming the protagonist or help it achieve its goal. These results did not stem from infants' inability to understand the scenarios presented: When encouraged to choose one of the two characters, 3–10-month-olds consistently preferred the nice one over the mean one (Hamlin et al., 2007, 2010; Hamlin & Wynn, 2011). Together, these results suggested that infants possess abstract concepts of welfare and harm, distinguish between positive and negative actions, and hold affiliative attitudes consistent with these valences. Nevertheless, infants seemed to lack principle-based expectations about individuals' actions toward others, suggesting that the skeletal framework for sociomoral

reasoning included moral concepts, but not moral principles (e.g., infants held no expectations as to whether the characters would harm or help the protagonist, but they did recognize harm or help when they saw it).

This characterization of early morality began to change, however, as researchers went on to explore other scenarios. It is now becoming clear that the skeletal framework that guides early sociomoral reasoning does include a small set of principles. However, because most of these principles apply only when specific pre-conditions are met, expectations related to the principles can be observed only with scenarios that satisfy these pre-conditions. For example, if infants view helping as expected only among ingroup members, then they will expect an individual to aid another only when the two are clearly identified as members of the same social group.

Over the past few years, evidence has slowly been accumulating for at least four sociomoral principles (Baillargeon et al., 2015). The most general is *fairness*, which applies broadly to all individuals: All other things being equal, individuals are expected to treat others fairly, according to their just deserts. At the next level of generality is *harm avoidance*: When individuals belong to the same moral circle (e.g., humans), they are expected not to cause significant harm to each other. At the next level of generality is *ingroup support*: When individuals in a moral circle belong to the same social group (e.g., teammates), additional expectations of ingroup care and ingroup loyalty are brought to bear. Finally, at the fourth and most specific level is *authority*: When individuals in a social group are identified as authority figures or subordinates, further expectations related to these group roles come into play (e.g., rectifying transgressions for the authority figures, obeying directives for the subordinates). Thus, each new structure in the social landscape—moral circle, social group, group roles—brings forth new expectations about how individuals will act toward others.

This emerging characterization of early morality supports long-standing claims, by a broad cross-section of social scientists, that the basic structure of human moral cognition includes a small set of universal foundations or principles (Baumard, André, & Sperber, 2013; Brewer, 1999; Cosmides & Tooby, 2013; Dawes et al., 2007; Dupoux & Jacob, 2007; Graham et al., 2013; Jackendoff, 2007; Pinker, 2002; Rai & Fiske, 2011; Shweder, Much, Mahapatra, & Park, 1997; Tyler & Lind, 1992; Van Vugt, 2006). Although details about the nature and contents of these principles vary across accounts, common assumptions are that the principles evolved during the millions of years our ancestors lived in small groups of hunter-gatherers, where survival depended on cooperation within groups and to a lesser extent between groups; that the principles interact in various ways and must be rank-ordered when they suggest distinct courses of action; and that different cultures implement, stress, and rank-order the principles differently, resulting in the diverse moral landscape that exists in the world today. Graham et al. (2013) aptly described this view as "a theory about the universal first draft of the moral mind and about how that draft gets revised in variable ways across cultures" (p. 65).

In the remainder of this chapter, we review some of the recent evidence that principles of fairness, harm avoidance, ingroup support, and authority are included in the "first draft" of moral cognition.

Fairness

According to the principle of fairness, all other things being equal, individuals are expected to treat others fairly when allocating windfall resources, dispensing rewards, or meting out punishments (Baillargeon et al., 2015; Dawes et al., 2007; Graham et al., 2013; Rai & Fiske, 2011). Traditionally, investigations of fairness in preschoolers have used *first-party* tasks, where the children tested are potential recipients, and *third-party* tasks, where they are not. Perhaps not

surprisingly given young children's pervasive difficulty in curbing their self-interest, a concern for fairness has typically been observed only in third-party tasks (Baumard, Mascaro, & Chevallier, 2012; Olson & Spelke, 2008). Building on these results, investigations with infants have also used third-party tasks to examine early expectations about fairness.

Equality

Do infants expect a distributor to divide windfall resources equally between similar recipients? In a series of experiments (Buyukozer Dawkins, Sloane, & Baillargeon, 2019; Sloane, Baillargeon, & Premack, 2012), 4-, 9-, and 19-month-olds were tested using the violation-of-expectation method (this method takes advantage of infants' natural tendency to look longer at events that violate, as opposed to confirm, their expectations). Infants faced a puppet-stage apparatus and saw live events in which an experimenter brought in two identical items (e.g., two cookies) and divided them between two identical animated puppets (e.g., two penguins). In one event, the experimenter gave one item to each puppet (*equal* event); in the other, she gave both items to the same puppet (unequal event; **Fig. 1A**). At all ages, infants looked significantly longer if shown the unequal as opposed to the equal event, and this effect was eliminated if the puppets were inanimate (i.e., neither moved nor spoke).

Consistent with the claim that fairness applies broadly, positive results were also obtained when a monkey puppet divided items between two giraffe puppets (Bian, Sloane, & Baillargeon, 2018), and when an orange circle with eyes divided items between two yellow triangles with eyes (Meristo, Strid, & Surian, 2016). At the same time, however, other findings revealed that when the number of items allocated was increased to four, infants under 12 months of age failed to detect a violation when one recipient was given three items and the other recipient was given one item (Schmidt & Sommerville, 2011; Ziv & Sommerville, 2017). Thus, while a concern for

fairness emerges early in life, there are initially sharp limits to the fairness violations young infants can detect, for reasons that are currently being explored.

Equity

The preceding findings demonstrate that even young infants possess an expectation of fairness. But how should this expectation be construed? Do infants possess a simple concept of *equality* and expect all individuals to be treated similarly, or do they possess a richer notion of *equity* and expect individuals to receive their just deserts? One way to examine this issue is to present infants with scenarios in which treating individuals the same way would violate fairness. For example, would infants expect a worker, but not a slacker, to receive a reward? To find out, 21-month-olds were shown events in which an experimenter asked two assistants to put away a pile of toys and then left; next to each assistant was a clear lidded box (Sloane et al., 2012). In the *both-help* event, each assistant placed about half of the toys in her box and then closed it. The experimenter then returned, inspected both boxes, and rewarded each assistant with a sticker. The *one-helps* event was similar except that one assistant put away all the toys in her box while the other assistant continued to play. Nevertheless, as before, the experimenter gave each assistant a reward (**Fig. 1B**). Infants looked significantly longer if shown the one-helps as opposed to the both-help event, and this effect was eliminated when the boxes were opaque so the experimenter could no longer determine by inspecting the boxes who had worked in her absence.

Additional experiments indicated that 10-month-olds detected a violation when an experimenter praised two assistants equally even though she could see that only one had performed the assigned task (Buyukozer Dawkins, Sloane, & Baillargeon, 2017); 21-month-olds detected a violation when an experimenter punished two assistants equally even though she

could see that only one had not performed the assigned task (Buyukozer Dawkins et al., 2017); and 17-month-olds detected a violation when two workers shared a resource in a manner inconsistent with their respective efforts in obtaining this resource (Wang & Henderson, 2018).

Together, the preceding results suggest that infants' concern for fairness is equity-based: Infants expect individuals to get their just deserts, be it an equal share of a windfall resource, a reward commensurate with their efforts, or a punishment that befits their actions.

Ingroup Support

According to the principle of ingroup support, members of a social group are expected to act in ways that sustain the group (Baillargeon et al., 2015; Brewer, 1999; Graham et al., 2013; Rai & Fiske, 2011; Shweder et al., 1997). The principle has two corollaries, *ingroup care* and *ingroup loyalty*, each of which carries a rich set of expectations. With respect to ingroup care, for example, one is expected (a) to provide help and comfort to ingroup members in need and (b) to limit harm to ingroup members by refraining from unprovoked harm and by curbing retaliation. Similarly, with respect to ingroup loyalty, one is expected (c) to prefer ingroup members over outgroup members, and (d) to reserve limited resources for the ingroup. Below, we report evidence that infants already hold these expectations.

Helping the Ingroup

Do infants view helping as expected with an ingroup individual, but as optional otherwise? In one experiment, 17-month-olds watched events involving three female experimenters, E1–E3, who sat around three sides of an apparatus and announced their group memberships via novel labels (Jin & Baillargeon, 2017). In the *ingroup* condition, E1 (on the right) and E2 (in back) belonged to the same group (e.g., "I'm a bem!", "I'm a bem, too!"), while E3 (on the left) belonged to a different group ("I'm a tig!"). In the *outgroup* condition, E2

belonged to the same group as E3 instead of E1 (E1: "I'm a bem!", E2: "I'm a tig!", E3: "I'm a tig, too!"). Finally, in the *no-group* condition, the Es used phrases that provided incidental information about objects they had seen, rather than inherent information about their social groups (E1: "I saw a bem!", E2: "I saw a bem, too!", E3: "I saw a tig!"). In the test trial, E3 was absent (her main role was to help establish group affiliations), and while E2 watched, E1 selected discs of decreasing sizes from a clear box and stacked them on a base. The final, smallest disc rested across the apparatus from E1, out of her reach (but within E2's reach). E1 tried in vain to reach the disc until a bell rang; at that point, E1 said, "Oh, I have to go, I'll be back!", and then she left. Next, E2 picked up the smallest disc, inspected it, and either placed it in E1's box so that she could complete her stack when she returned (*help* event) or returned it to its same position on the apparatus floor, out of E1's reach (*ignore* event; **Fig. 2A**).

Infants in the ingroup condition looked significantly longer if shown the ignore as opposed to the help event, whereas infants in the outgroup and no-group conditions looked equally at the events. Thus, in accordance with the principle of ingroup care, infants detected a violation when E2 chose not to help ingroup E1. In additional experiments (Jin, Houston, Baillargeon, Groh, & Roisman, 2018), 4-, 8-, and 12-month-olds were shown videotaped events in which a woman was performing a household chore when a baby (who presumably belonged to the same group as the woman) began to cry. The woman either attempted to comfort the baby (*comfort* event) or ignored the baby and continued her work (*ignore* event). At all ages, infants detected a violation in the ignore event, and this effect was eliminated if the baby laughed instead.

Limiting Harm toward the Ingroup

If infants' sense of ingroup care modulates their expectations about harm avoidance, they

might expect individuals to direct *less* unprovoked and retaliatory harm at ingroup members than at outgroup members. To examine these predictions, 18-month-olds were first tested in a baseline, *outgroup* experiment (Ting, He, and Baillargeon, 2019a). Three female experimenters, E1–E3, sat around three sides of an apparatus, and their group memberships were marked by salient outfits: E1 (on the right) wore one outfit, while E2 (in back) and E3 (on the left) wore a different outfit. While E2 and E3 watched, E1 used small blocks to build two towers of four blocks. In the next trial, E3 was absent, and E2 ate crackers from a small plate in front of her while watching E1 build a third tower. After completing this tower, E1 either simply left the scene (*no-provocation* condition) or first stole a cracker from E2 and then left the scene (*provocation* condition). In both conditions, E2 then knocked down one block from one tower (*one-block* event), one tower (*one-tower* event), or two towers (*two-tower* event). In the no-provocation condition, infants looked significantly longer if shown the one- or two-tower event as opposed to the one-block event; in the provocation event, in contrast, infants looked significantly longer if shown the one-block or one-tower event as opposed to the two-tower event. Thus, when no provocation had occurred, infants detected a violation in all but the one-block event: Mild unprovoked harm to outgroup E1 was acceptable, but more significant harm was not. Following provocation, however, infants detected a violation in all but the two-tower event, suggesting that they viewed knocking down at least two of outgroup E1's towers as an appropriate retaliatory response for her theft of one cracker (perhaps in a sort of "two-for-one" accounting).

Would infants show similar expectations if E1 and E2 belonged to the same group, or would considerations of ingroup care modulate these expectations, leading infants to expect both less unprovoked harm and less retaliatory harm? To find out, infants were tested in an *ingroup*

experiment identical to that above except that E2 wore the same outfit as E1 and hence belonged to the same group. Across conditions, infants now detected a violation in all but the one-block event of the provocation condition. Thus, when no provocation had occurred, infants expected E2 to refrain from knocking down *any* of ingroup E1's blocks; following provocation, knocking down one block became permissible in retaliation for ingroup E1's theft—but no more than one block and certainly not two towers, as in the outgroup experiment (**Fig. 2B**).

Together, the preceding results make clear that from an early age, considerations of ingroup care modulate expectations about harm avoidance: Infants expect stricter limits on unprovoked and retaliatory harm when directed at ingroup members. In line with these results, recent experiments have found that infants also expect individuals to *punish* harm to in-group members, at least indirectly, through the withholding of help (Ting, He, & Baillargeon, 2019b). When a bystander saw a wrongdoer harm a victim, and the wrongdoer subsequently needed help to complete a task, 13-month-olds expected the bystander to refrain from providing help if the victim was an in-group member, but not if she was an out-group member. Infants' concern for in-group care thus leads them to expect individuals both to limit harm to in-group members and to punish such harm, at least indirectly, when perpetrated by others.

Preferring the Ingroup

Do infants expect individuals in a group to prefer ingroup members over outgroup members, in accordance with the principle of ingroup loyalty? In one experiment (Bian & Baillargeon, 2016), 12-month-olds again saw events involving three female experimenters, E1–E3, whose group memberships were marked by salient outfits. In one familiarization trial, E2 (in back) sat alone; she picked up two-dimensional toys on the apparatus floor and placed them in a box near her, thus giving infants the opportunity to observe her outfit. In the next familiarization

trial, E2 was absent, and E1 (on the right) and E3 (on the left) read identical books; one E wore the same outfit as E2, and the other E wore a different outfit. In the test trial, E1 and E3 were joined by E2, who approached either the E from the same group (*approach-same* event) or the E from the other group (*approach-different* event; **Fig. 2C**) to read along. Infants looked significantly longer at the approach-different than at the approach-same event, suggesting that they expected E1 to approach her ingroup member, in accordance with ingroup loyalty, and they detected a violation when she did not. This effect was eliminated when the first familiarization trial was modified to reveal that E2's outfit served an instrumental role: She now placed the toys she picked up in a large kangaroo pocket on her shirt, instead of in the box near her. Infants looked equally at the approach-different and approach-same events, suggesting that they no longer viewed the Es' outfits as providing information about their group memberships (in the same way, adults would not view pedestrians holding black umbrellas in the rain on a busy street, or travelers pulling black suitcases in a busy airport, as belonging to the same groups).

Similar results have been obtained in tasks using other cues to group memberships. After watching non-human adult characters soothe baby characters, 16-month-olds detected a violation if one baby preferred a baby who had been soothed by a different adult (and hence presumably belonged to a different group) over a baby who had been soothed by the same adult (and hence presumably belonged to the same group) (Spokes & Spelke, 2017). After watching two groups of non-human characters (identified by both physical and behavioral cues) perform distinct novel conventional actions, 7–12-month-olds detected a violation if a member of one group chose to imitate the other group's conventional action (Powell & Spelke, 2013). Finally, when faced with a native speaker of their language and a foreign speaker, 10–14-month-olds were more likely to prefer the native speaker (Kinzler, Dupoux, & Spelke, 2007), to select snacks endorsed by the

native speaker (Shutts, Kinzler, McKee, & Spelke, 2009), and to imitate novel conventional actions modeled by the native speaker (Buttelmann, Zmyj, Daum, & Carpenter, 2013). One interpretation of these last results is that in this minimal setting contrasting two unfamiliar individuals, language served as a natural group marker, leading infants to prefer and align with the native speaker, in accordance with ingroup loyalty.

Favoring the Ingroup When Resources Are Limited

If infants' sense of ingroup loyalty modulates their expectations about fairness, they might expect a distributor to favor ingroup over outgroup recipients, particularly when resources are scarce or otherwise valuable. To examine this prediction, 19-month-olds saw resource-allocation events involving two groups of animated puppets, monkeys and giraffes (Bian et al., 2018). A puppet distributor (e.g., a monkey) brought in either three (*3-item* condition) or two (*2-item* condition) items and faced two potential recipients, an ingroup puppet (another monkey) and an outgroup puppet (a giraffe). In each condition, the distributor allocated two items: She gave one item each to the ingroup and outgroup puppets (*equal* event; **Fig. 2D**), she gave both items to the ingroup puppet (*favors-ingroup* event), or she gave both items to the outgroup puppet (*favors-outgroup* event). In the 3-item condition, the third item was not distributed and was simply taken away by the distributor when she left. Infants in the 3-item condition looked significantly longer if shown the favors-ingroup or favors-outgroup event than if shown the equal event, suggesting that when there were as many items as puppets, infants expected fairness to prevail: They detected a violation if the distributor chose to give two items to one recipient and none to the other, regardless of which recipient was advantaged. In contrast, infants in the 2-item condition looked significantly longer if shown the equal or favors-outgroup event than if shown the favors-ingroup event, suggesting that when there only enough items for the group to which

the distributor belonged (e.g., two items and two monkeys), infants expected ingroup loyalty to prevail: They detected a violation if the distributor gave any of the items to the outgroup puppet.

Together, these results suggest two conclusions. First, the "first draft" of moral cognition includes not only principles of fairness and ingroup support but also a context-sensitive ordering of these principles that befits their contents: One is expected to adhere to fairness except in contexts where doing so would be detrimental to one's group. Second, a shortage of resources is one such context: When there is not enough to go around, the group must come first.

Authority

According to the principle of authority, when a social group accepts an individual in the group as a legitimate leader, rich expectations come into play that reflect this power asymmetry (Baillargeon et al., 2015; Graham et al., 2013; Rai & Fiske, 2011; Tyler & Lind, 1992; Van Vugt, 2006). On the one hand, the leader is expected to maintain order, provide protection, and facilitate cooperation toward group goals. On the other hand, the subordinates are expected to obey, respect, and defer to the leader. Do infants already possess authority-based expectations about the behaviors of leaders toward their subordinates or about the behaviors of subordinates toward their leaders?

Before addressing this question, developmental researchers first had to determine whether infants could represent power asymmetries. Over the past decade, evidence has steadily accumulated that by the second year of life, infants (a) can detect differences in social power (Pun, Birch, & Baron, 2016; Thomsen, Frankenhuis, Ingold-Smith, & Carey, 2011), (b) expect such differences to both endure over time and extend across situations (Enright, Gweon, & Sommerville, 2017; Mascaro & Csibra, 2012), and (c) distinguish between powerful individuals with respect-based as opposed to fear-based power (Margoni, Baillargeon, & Surian, 2018).

Building on these results, recent experiments examined whether infants might also hold expectations about one specific type of respect-based power, the legitimate power of an authority figure (Stavans & Baillargeon, 2019). Specifically, these experiments asked whether infants would expect a powerful individual in a group to rectify a transgression perpetrated by one subordinate against another. The rationale was that positive results would suggest that infants cast the powerful individual in the role of legitimate leader and hence expected this leader to restore order in the group, in accordance with the principle of authority.

In these experiments, 17-month-olds watched live interactions among a group of three bear puppets (Stavans & Baillargeon, 2019). One puppet (at the back of the apparatus) served as the leader, and the other two puppets (on the left and right sides) served as the subordinates; in front of each subordinate was a placemat. In different scenarios, the leader was identified either by its larger size (physical cue) or by the subordinates' compliance with its instructions (behavioral cue); results were identical across scenarios, so the size-based scenario is used here. To start, the leader brought in a tray with two identical toys to be shared by the subordinates. However, one subordinate (the perpetrator) quickly grabbed both toys and deposited them on its placemat, so that the other subordinate (the victim) did not get a toy. In one event, the leader rectified this transgression by taking one of the toys away from the perpetrator and giving it to the victim (*rectify* event). In the other event, the leader again approached each subordinate in turn but did nothing to correct the transgression (*ignore* event; **Fig 3**). Infants looked significantly longer if shown the ignore as opposed to the rectify event, and this effect was eliminated if the leader was replaced by another member of the group who gave no evidence of being a leader (e.g., another bear of the same size as the two subordinates).

Together, these results suggest that when infants identify an individual as a legitimate

leader in a group, they then expect this leader to restore order if one subordinate transgresses against another, in accordance with the authority principle.

Conclusions

The evidence reviewed in this chapter suggests that from a very young age, a skeletal framework of abstract principles guides infants' sociomoral reasoning. These principles include fairness, harm avoidance, ingroup support (with its corollaries of ingroup care and ingroup loyalty), and authority. Although considerable research will be needed to fully understand the "first draft" of human moral cognition and how it is revised by experience and culture (Graham et al., 2013), available findings already indicate that this "first draft" makes possible surprisingly sophisticated moral expectations, evaluations, and attitudes.

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Figure Captions

Fig. 1: Infants detect a fairness violation when an experimenter fails to divide windfall resources equally between two similar recipients (A) or fails to dispense rewards equitably between a worker, who put away toys as instructed, and a slacker, who did no work (B).

Fig. 2: Infants detect an ingroup-support violation when an individual fails to help an ingroup member in need of assistance (A), fails to curb retaliation against an ingroup member who stole

and ate a cracker (B), fails to prefer an ingroup member over an outgroup member (C), and fails to favor the ingroup when distributing limited resources (D).
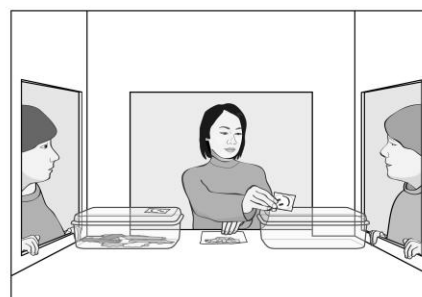
Fig. 3: Infants detect an authority violation when a leader (here marked by its larger size) in a group fails to rectify a transgression between subordinate members of the group.

Fairness Violations
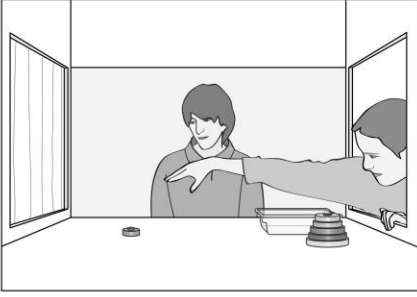
A. Failing to distribute resources equally
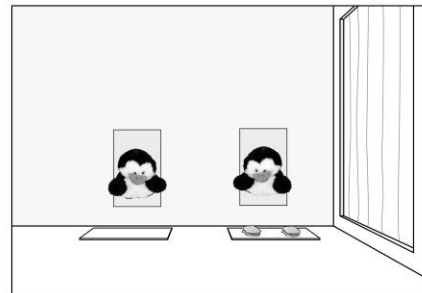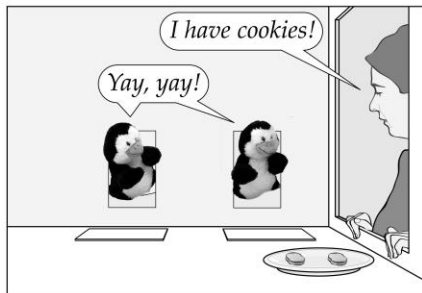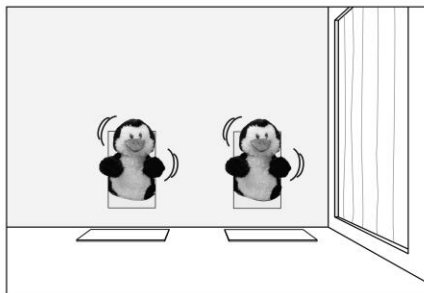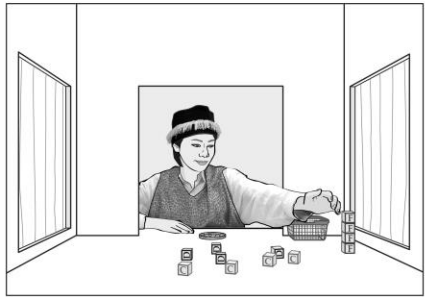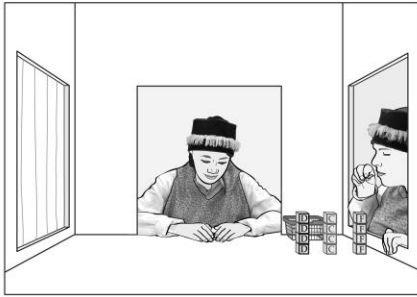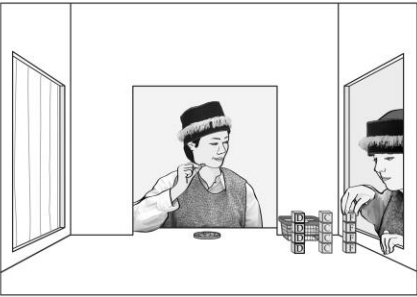

B. Failing to dispense rewards equitably

Ingroup-Support Violations

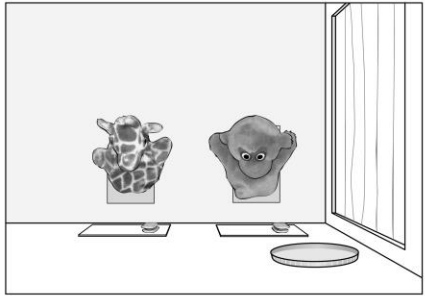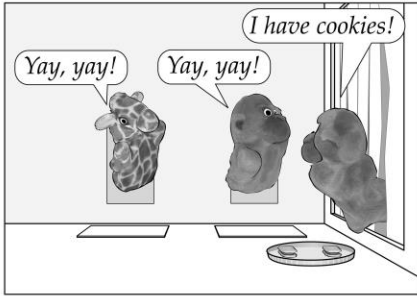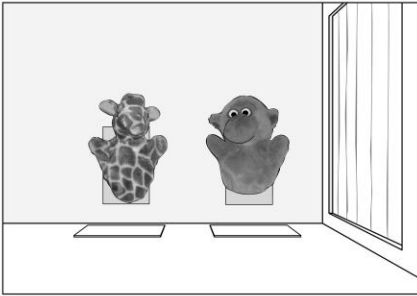## A. Failing to help the ingroup

B. Failing to curb retaliation against the ingroup

C. Failing to prefer the ingroup
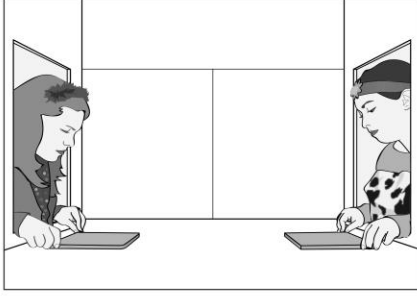
D. Failing to favor the ingroup when dividing limited resources

Authority Violation

Failing to rectify a transgression