Infants expect leaders to right wrongs

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Anthropological and psychological research on direct third-party punishment suggests that adults expect the leaders of social groups to intervene in within-group transgressions. Here, we explored the developmental roots of this expectation. In violation-of-expectation experiments, we asked whether 17-mo-old infants ($n = 120$) would expect a leader to intervene when observing a within-group fairness transgression but would hold no particular expectation for intervention when a nonleader observed the same transgression. Infants watched a group of 3 bear puppets who served as the protagonist, wrongdoer, and victim. The protagonist brought in 2 toys for the other bears to share, but the wrongdoer seized both toys, leaving none for the victim. The protagonist then either took 1 toy away from the wrongdoer and gave it to the victim (intervention event) or approached each bear in turn without redistributing a toy (nonintervention event). Across conditions, the protagonist was either a leader (leader condition) or a nonleader equal in rank to the other bears (nonleader condition); across experiments, leadership was marked by either behavioral or physical cues. In both experiments, infants in the leader condition looked significantly longer if shown the nonintervention as opposed to the intervention event, suggesting that they expected the leader to intervene and rectify the wrongdoer's transgression. In contrast, infants in the nonleader condition looked equally at the events, suggesting that they held no particular expectation for intervention from the nonleader. By the second year of life, infants thus already ascribe unique responsibilities to leaders, including that of righting wrongs.

infancy | sociomoral cognition | leadership | norm enforcement | direct third-party punishment

Hierarchical relations are one of the basic relational forms that structure human social life: Rank differences are found in most societies, including strongly egalitarian forager societies (1–4). Given the ubiquity of these relations, social scientists have long been interested in understanding how humans construe different types of hierarchical relations, and in specifying what attitudes and behaviors are associated with the higher and lower ranks in each type of relation. Evolutionary psychology, in particular, has suggested that at least 2 types of hierarchical relations emerged over the course of evolution as adaptations to different challenges faced by our distant ancestors. On the one hand, our ancestors often had to compete over scarce resources to survive, and those willing and able to use coercion or aggression to prevail tended to accrue benefits (e.g., food, mates) as others held back to avoid potentially injurious interactions. This could explain our human sensitivity to dominance-based power asymmetries, in which dominant individuals (acting either singly or with subordinate allies) use coercive power to achieve their own goals at the expense of others (5–11). On the other hand, our ancestors also survived by forming groups to solve collective problems (e.g., food acquisition, protection), and this group living, in turn, gave rise to new social challenges (e.g., coordinating group movements, resolving within-group conflicts). In this context, those individuals, often the strongest, most skilled, or most knowledgeable, who took charge and sought to facilitate coordination, resolve within-group conflicts, and promote cooperation were acknowledged as leaders and shown respect and deference by other group members. This could explain our human sensitivity to leadership-based power asymmetries, in which leaders use legitimate power to advance the goals of the group, sometimes at their own expense (5–20).

In line with these speculations about the emergence of leadership-based asymmetries, a number of social scientists have proposed that over the course of human history, abstract expectations could have evolved in our species about leaders' responsibilities to their followers (1, 11, 13, 21, 22). Fiske (21), in particular, has described these responsibilities as ones that are "universally intuitive and that young children innately expect. For children and adults, the social meaning of appropriate actions in this modality is immediately apprehended, inherently evocative, and experienced as normatively binding." If role-based expectations about leaders are indeed a part of our human endowment and emerge early in life, then even infants might ascribe specific responsibilities to leaders. The present research was designed to examine this possibility.

Leaders and Within-Group Conflict Resolution

As alluded to above, a key responsibility of leaders appears to be that of resolving within-group conflicts, which is defined here broadly to encompass policing, enforcing group norms, intervening to right wrongs, and punishing free riders and wrongdoers. There are several ways in which such an assignment of responsibility might be advantageous for groups: It reduces the costs associated with direct third-party punishment to a single individual; having a leader be the main arbiter of punishment eliminates the risk of overpunishment by peers and results in sanctions that are more fair; leaders are somewhat protected from retaliation or counterpunishment by their position of power and by the group members they can muster for assistance if needed; and, relatedly, leaders can

Significance

Social scientists have proposed that expectations about leadership-based power asymmetries have gradually evolved over the course of human history. Some of these expectations concern leaders' responsibilities to their followers. In particular, leaders are expected to intervene in within-group transgressions and confront the wrongdoers. In violation-of-expectation experiments, we examined whether 17-mo-old infants would share this expectation about leaders. When a fairness transgression occurred among a group of bear puppets, infants expected a leader to intervene and rectify this transgression, but they held no particular expectation for intervention from a nonleader. Thus, consistent with claims that abstract expectations about leaders' responsibilities are part of the human endowment, our findings indicate that such expectations are already present by the second year of life.

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punish more effectively (e.g., inflict greater costs, deny access to resources), and hence pose a more credible threat of punishment, than nonleaders (3, 16, 18, 20).

Several lines of evidence support the notion that leaders are particularly associated with conflict resolution in groups. Some of this evidence involves observational data from small-scale societies (23, 24). In a study by Smith et al. (23), for example, researchers compared leadership in 4 domains—collective movement, food acquisition, within-group conflict resolution, and between-group interactions (whether peaceful or hostile)—in 8 small-scale societies from North and South America and Africa. Leadership in each domain was rated on several dimensions, including how centralized it was (i.e., the proportion of group members who led in the domain) and how powerful it was (i.e., the ability to motivate followers to behave in particular ways in the domain). Results indicated that leadership was particularly centralized and powerful in the domains of within-group conflict resolution and between-group interactions. In another study, Wiessner (24) analyzed the dynamics of norm enforcement and punishment in conversations among the !Kung recorded in the 1970s and 1990s. Although men and women of all statuses and ages could and did engage in punishment, individuals who were evaluated by the !Kung as strong or influential (and were often considered to be camp leaders) punished twice as often as individuals who were evaluated as average or weak.

Additional evidence that leaders are particularly associated with within-group conflict resolution comes from experiments using public good games (25–27). In a typical round, each participant in a group receives an allocation and chooses what portion to contribute to a group fund; any contribution is increased by some percentage, yielding a higher payoff for each group member. In general, contributions are higher when a single individual in the group is allowed to punish uncooperative behavior by making deductions (27), and all the more so when this punisher is an elected leader. In a "lab-in-the-field" experiment involving Ugandan farmers (25), higher levels of cooperation were found when the punisher was elected by a secret ballot as opposed to selected through a random lottery (participants came from different villages and did not know more than 1 or 2 other members of their assigned group). Moreover, this effect was found both 1) when punishment was first introduced, before the punisher had the opportunity to punish anyone, and 2) following punishment of uncooperative participants. The authors concluded that while punishment by randomly chosen leaders could promote cooperation beyond baseline levels, punishment by elected leaders was more effective because their greater perceived legitimacy enhanced their authority, and hence their ability to foster and enforce cooperation. Similar results were found when the punisher was not an elected leader but a group member to whom other members could voluntarily transfer punishment power (26). Higher power centralization was associated with a higher level of cooperation and a more pronounced decline in punishment over the course of the experiment, as "group members already reacted to the threat of powerful punishment due to power centralization, not only to actual punishment."

Finally, evidence that leaders are closely associated with within-group conflict resolution also comes from experiments examining responses to uncivil behaviors (28–30). In one experiment (29), adults watched a videotaped scenario in which a coworker (the wrongdoer) behaved uncivilly toward another coworker (the victim). Before the videotaped session, participants were assigned to the role of either supervisor or equal-status coworker, relative to the wrongdoer and the victim. Following the videotaped session, participants were asked to evaluate the likelihood that they would confront or avoid the wrongdoer. Participants were more likely to report that they would intervene, and less likely to report that they would avoid the wrongdoer, when they were assigned to the role of supervisor as opposed to coworker. In a follow-up experiment, participants were asked to recall an actual workplace incident of incivility they had observed and to report how they had responded to it. Here again, interventions were more likely when participants held a higher power position than the wrongdoer and perceived responsibility (e.g., "I felt obligated to act") mediated the relationship between power position and intervention. Similar results were found in experiments that used written scenarios to examine participants' expectations about responses to uncivil behaviors (28). In one scenario, for example, participants imagined they were part of a university society that retired to a bar after an evening meeting; a member of the group (the wrongdoer) transgressed against a stranger, and participants were asked questions about another group member who was either a leader (current society president) or a follower (new member of the society). Across scenarios, results indicated that participants believed the leader was more likely to intervene than not, and this was true regardless of the wrongdoer's status, although the risk of retaliation was deemed greater with a high-status wrongdoer. For the follower, participants expected nonintervention for a high-status wrongdoer and viewed intervention and nonintervention as equally likely for an equal-status wrongdoer. Participants were also more willing to nominate the leader in an upcoming election if he had intervened than if he had not, and this effect was weaker for the follower. The authors concluded that leaders are expected to intervene and rectify wrongs by any group members irrespective of status, and can lose their position of leadership if they fail to act in accordance with these role-based expectations.

Together, these results suggested that a key responsibility of leaders is that of within-group conflict resolution. Building on these results, we examined in violation-of-expectation experiments whether 17-mo-old infants would expect a leader who observed a within-group transgression to intervene and rectify it, but would hold no particular expectation for intervention from a nonleader who observed the same transgression. Such a result would indicate that infants in the second year of life already view righting wrongs as one of the responsibilities of group leaders.

Prior Developmental Findings

How likely were 17-mo-old infants to expect leaders to intervene in within-group transgressions? Two sets of developmental findings, summarized below, gave weight to this possibility and lay the foundations for our research.

Power Asymmetries. There is considerable evidence that infants can use a variety of behavioral and physical cues to detect power asymmetries, and that they expect such asymmetries to persist over time and extend across situations (31–37). In one experiment (34), for example, 15-mo-olds were first familiarized to a computer-animated event involving 2 similar-sized nonhuman characters, A and B: A initially occupied a small enclosure, but then B arrived and pushed A out of it. The test trials involved a new scenario about the collection of an object: When an object appeared, A and B both approached it, faced off briefly, and then either A (unexpected event) or B (expected event) collected it. Infants looked significantly longer at the unexpected event, suggesting that they expected B to also prevail in collecting the object. This and other results indicated that infants detected a power asymmetry in the familiarization scenario and expected it to be stable over time and to extend to the test scenario.

There is also evidence that infants can distinguish between leadership-based and dominance-based power asymmetries and hold specific expectations about followers' behaviors toward their leaders (33, 36). In one experiment (33), 21-mo-olds were assigned to a leader or a bully condition and were first familiarized to a computer-animated event involving 1 yellow protagonist and 3 red characters. In the leader condition, the characters were playing ball in a field next to a house when the protagonist arrived; the characters bowed to her in unison while saying "Ohhhh!" reverently, and then they gave her their ball. In the bully condition, the protagonist hit each character in turn and stole their ball. In the test trials, infants in both conditions saw new events in which the characters were again playing in the field when the protagonist arrived and ordered them to go to bed; the characters then filed into the house and could be seen through its front window. Next, the protagonist left the scene, and the characters

either returned to the field (unexpected event) or remained in the house and went to sleep (expected event). Infants in the leader condition looked significantly longer at the unexpected event than at the expected event, whereas infants in the bully condition looked equally at the events. These and other results suggested that infants in the leader condition detected a leadership-based asymmetry in the familiarization scenario and brought to bear abstract expectations about how followers behave toward their leaders to determine how the characters would respond to the leader's order in the test scenario.

Together, the preceding results suggested that at least by the second year of life, infants can detect a variety of power asymmetries, including leadership-based asymmetries, and hold expectations about followers' behaviors toward their leaders. The present experiments explored the complementary question of whether infants would also hold expectations about leaders' behaviors toward their followers, particularly in the domain of within-group conflict resolution.

Interventions in Transgressions. To our knowledge, only a single report, by Kanakogi et al. (38), has examined infants' expectations about interventions in transgressions. Six-month-olds saw computer-animated events involving 4 nonhuman characters: A wrongdoer, a victim, and 2 protagonists. There was no information to signal that the characters belonged to the same social group or that either protagonist was a leader. In one event, the wrongdoer followed the victim around an enclosure and repeatedly hit the victim; one of the protagonists watched this interaction while trapped alone inside the enclosure. Next, openings appeared on either side of the enclosure; the protagonist left via the opening that placed it between the wrongdoer and the victim, and the event then ended, with the protagonist standing between them (intervention event). The other event was identical except that it involved the other protagonist, which left the enclosure via the opposite opening, away from the wrongdoer and the victim (nonintervention event). Infants looked equally at the 2 events, suggesting that they had no particular expectation that either protagonist would intervene: Had they held such an expectation, they would have looked significantly longer at the nonintervention than at the intervention event. This negative result was not due to infants' inability to understand the events: When presented with replicas of the 2 protagonists [in a method adapted from Hamlin et al. (39)], infants significantly preferred the protagonist that had intervened over the one that had not.

The authors took this last result to point to an early-emerging preference for individuals who are willing to intervene to protect victims from wrongdoers, but some caution is needed in accepting this conclusion. Because the protagonist in the intervention event took no further action after inserting itself between the victim and the wrongdoer, the data are open to an alternative interpretation: Infants could have preferred the protagonist in the intervention event not because it sought to protect the victim but simply because it was willing to approach the wrongdoer (and hence was not afraid of it). This interpretive issue aside, the data suggested that in the absence of group and leadership cues, infants do not hold expectations about whether an individual who witnesses a transgression will intervene, although they do prefer one who does over one who does not. This provided a useful starting point for our research, which asked whether infants would expect a leader to intervene when observing a within-group transgression.

The Present Research

In experiments 1 and 2, infants watched live events involving a group of 3 bear puppets who spoke in female voices and played the roles of protagonist, wrongdoer, and victim. The protagonist introduced 2 identical toys for the other bears to share. Both bears then approached the toys, but the wrongdoer quickly seized both toys, leaving none for the victim. Next, the protagonist either redistributed one of the toys from the wrongdoer to the victim (intervention event) or approached each bear in turn without redistributing a toy (nonintervention event). In each experiment, the protagonist was portrayed either as a leader, who was identified by behavioral (experiment 1) or physical (experiment 2) cues (leader condition), or as a nonleader, who gave no cue of having social power over the other bears (nonleader condition).

Our experiments focused on 17-mo-old infants for 3 reasons. First, infants aged 16 to 19 mo have been found to spontaneously categorize animals of the same kind into the same social group (40, 41), and this suggested that infants would view the 3 bears as members of the same group. Second, there is considerable evidence that infants aged 15 to 21 mo possess an abstract and equity-based expectation of fairness: When windfall resources are divided among similar individuals, for example, infants expect each individual to receive an equal share (42–46). This suggested that infants would perceive the wrongdoer and the victim, 2 group members of equal standing, to be entitled to an equal share of the toys, and hence that they would detect a fairness transgression when the wrongdoer took both toys, leaving none for the victim. Finally, there is also evidence that infants aged 12 to 17 mo possess an abstract expectation of ingroup support: For example, individuals in a group are expected to care for each other by refraining from unprovoked harm and by providing assistance when needed (47–50). This suggested that infants would also perceive an ingroup-support transgression in our events and would be particularly sensitive to the plight of the victim, who was treated unfairly by a member of her own group.

Of interest was how infants would expect the protagonist to respond to the wrongdoer's transgression. If infants simply brought to bear their concerns for fairness and ingroup support when reasoning about the protagonist's actions, then they might expect both the leader and the nonleader to intervene and redistribute one of the toys. In this case, infants in both conditions would look significantly longer if shown the nonintervention as opposed to the intervention event. On the other hand, if infants also reasoned that directly intervening in a within-group transgression 1) is potentially dangerous due to the risk of retaliation or counterpunishment by the wrongdoer and 2) is required for leaders but optional for nonleaders, then different looking patterns should be found in the 2 conditions. In the leader condition, infants should look significantly longer at the nonintervention than at the intervention event, in accordance with the notion that leaders are expected to right wrongs within their groups. In the nonleader condition, in contrast, infants should look equally at the 2 events, because they could make sense of both outcomes: The nonleader might choose not to intervene due to the risk of retaliation, or she might choose to do so despite this risk so as to rectify the unfair treatment of her ingroup member. Thus, finding in each experiment that infants in the leader condition looked significantly longer if shown the nonintervention as opposed to the intervention event, whereas infants in the nonleader condition looked equally at the 2 events, would indicate that by the second year of life, infants already expect leaders to confront wrongdoers within their groups.

Experiment 1

Infants ($n = 48$) were randomly assigned to a leader or a nonleader condition. In each condition, infants received 2 identical familiarization trials followed by 1 test trial (Fig. 1). During these trials, infants watched interactions among 3 identical bear puppets who spoke in female voices and who wore overalls and hats that differed only in color (red, yellow, or blue). Each infant sat on a parent's lap facing a puppet-stage apparatus, and the 3 bears were positioned around the other 3 sides of the apparatus. The middle bear was always dressed in red; the 2 side bears were dressed in yellow and blue, and their positions were counterbalanced across infants and remained the same throughout the experiment.

The familiarization trials served to establish whether the middle bear was a leader or a nonleader relative to the side bears. To this end, we used a behavioral cue: The middle bear produced utterances that either exerted control over the side bears' behaviors

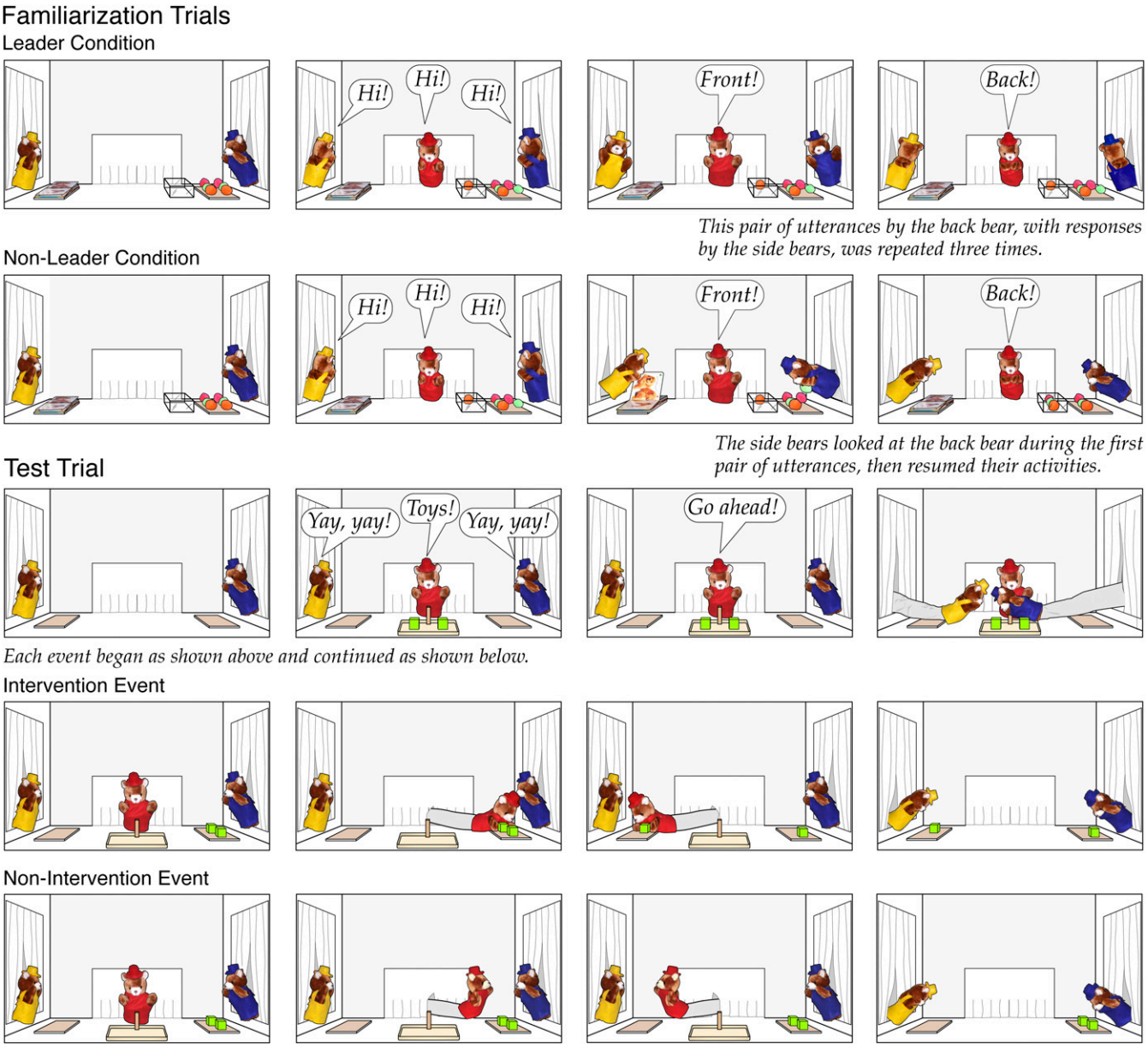

Fig. 1. Familiarization events (by condition) and test events in experiment 1.

(leader condition) or exerted no such control (nonleader condition). In the leader condition, each familiarization trial (38 s) was computer-controlled and began with the side bears performing different activities: The left bear read a picture book, while the right bear transferred pompoms from a placemat into a box. Next, the middle bear arrived, exchanged friendly greetings with the side bears ("Hi!"), and then issued 3 pairs of utterances. In each pair, the middle bear said "Front!" and "Back!" while energetically opening and closing her arms, respectively; each time the middle bear said "Front!", the side bears turned their bodies quickly toward the front of the apparatus, and each time she said "Back!", they turned quickly toward the back. To emphasize the contingency between the middle bear's utterances and the side bears' actions, we introduced short (1-s) and long (3-s) pauses between utterances across pairs. Finally, the middle bear announced "All done!", the 3 bears paused, and the trial ended. Familiarization trials in the nonleader condition were similar except that 1) during the first pair of utterances, the side bears simply watched the middle bear, and 2) during the other 2 pairs, each side bear resumed her initial activity (i.e., reading or storing pompoms). Across conditions, the middle bear thus performed exactly the same actions; only the responses of the side bears differed. We expected that infants would view the middle bear as a leader when her utterances exerted control over the side bears, who responded promptly to each utterance as though it were an order (for evidence that older children view giving orders that are promptly obeyed as a cue to leadership, see refs. 51 and 52). In contrast, we expected that infants would view the middle bear as an equal-status group member when her utterances exerted no control over the side bears and simply appeared to be self-addressed statements connected to her arm "exercises."

In the test trial, infants in both conditions saw either an intervention or a nonintervention event. The trial had an initial phase and a final phase, and looking times in the 2 phases were computed separately. In the (40-s) initial phase, the side bears first swayed left and right; in front of each bear was a placemat. Next, the middle bear (the protagonist) arrived, holding a tray with 2 identical toys (shiny green cubes), and deposited the tray

between the side bears. The protagonist announced "Toys!", to which the side bears responded excitedly "Yay, yay!". Next, the protagonist said "Go ahead!", as though inviting the side bears to share the toys. The side bears then approached the tray, but 1 bear (the wrongdoer) quickly seized both toys and brought them back to her placemat; the other bear (the victim) then returned to her placemat empty-handed. The identity (yellow or blue) and side (left or right) of the wrongdoer and victim were counterbalanced across infants. In the intervention event, the protagonist then approached the wrongdoer's placemat, grasped one of the toys, and placed it on the victim's placemat. Finally, the protagonist left with the empty tray, and the wrongdoer and victim looked down at their placemats (each bear now had 1 toy) and paused. During the final phase of the trial, infants watched this paused scene until the trial ended (see *Methods* for criteria). The nonintervention event was identical except that the protagonist did not redistribute any toys but simply approached and inspected first the wrongdoer's placemat and then the victim's placemat. Thus, the wrongdoer retained both toys, while the victim had none. Across events, the protagonist's actions were thus highly similar and differed only in whether she moved a toy from the wrongdoer's placemat to the victim's placemat or approached each placemat in turn without moving a toy.

Looking times in the final phase of the test trial (Fig. 2) were first log-transformed (53) due to positive skewness (for ease of communication, raw looking times are provided for all experiments). Next, the data were subjected to an ANOVA with condition (leader, nonleader) and event (intervention, nonintervention) as between-subject factors. The only significant effect was the condition × event interaction, $F(1,44) = 8.09$, $P = 0.007$, $\eta_p^2 = 0.16$. Planned comparisons revealed that as predicted, infants in the leader condition looked significantly longer if shown the nonintervention event (mean [M] = 19.51, SD = 11.80) as opposed to the intervention event (M = 9.77, SD = 2.51), $F(1,44) = 7.13$, $P = 0.011$, Cohen's $d = 1.06$, whereas infants in the nonleader condition looked about equally at the nonintervention (M = 11.35, SD = 5.93) and intervention (M = 14.48, SD = 5.75) events, $F(1,44) = 1.83$, $P = 0.183$, $d = -0.57$. Nonparametric Wilcoxon rank-sum tests confirmed the results of the leader ($Z = 2.17$, $P = 0.030$) and nonleader ($Z = -1.42$, $P = 0.157$) conditions.

Infants in the leader condition expected the protagonist to rectify the transgression she had observed, and they detected a violation when she did not. This result suggested that in the familiarization trials, infants detected a power asymmetry: The protagonist issued a series of utterances that caused the side bears to turn repeatedly toward the front or back of the apparatus, indicating that she had some control or influence over them. Moreover, because the exchanges among the bears were friendly and involved no coercion or intimidation, infants most likely construed this power asymmetry as leadership-based, with the protagonist as the leader and the other 2 bears as the followers. In the test trial, following the wrongdoer's transgression, infants brought to bear an abstract expectation that leaders have a responsibility to intervene in within-group conflicts, and they therefore detected a violation in the nonintervention event.

In contrast, infants in the nonleader condition tended to look equally at the intervention and nonintervention events. This result suggested that in the familiarization trials, infants perceived the 3 bears to be equal in social power, as there were no cues to suggest otherwise. In the test trial, infants held no expectation that nonleaders should confront wrongdoers, and they therefore viewed both events as plausible: In the nonintervention event, the nonleader chose not to rectify the wrongdoer's transgression due to the risk of retaliation, while in the intervention event, the nonleader chose to do so despite this risk, out of concern for the unfair treatment of her ingroup member. The results of the nonleader condition also helped rule out several alternative interpretations of the leader condition: In particular, that infants had a baseline preference for the nonintervention event, were puzzled by the middle bear's behavior in this event (e.g., why did she inspect the side bears' placemats?), or expected any bear that brought in the toys and permitted their use ("Go ahead!") to intervene as the toys' owner. Had any of these interpretations been correct, results would have been the same in the 2 conditions.

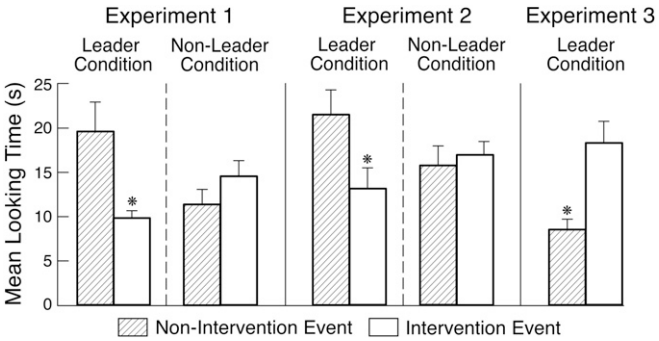

Fig. 2. Mean looking times in the final phase of the test trial in experiments 1 ($n = 48$), 2 ($n = 48$), and 3 ($n = 24$). Error bars represent SEM, and an asterisk denotes a significant difference between the 2 events ($P < 0.05$).

Together, the results of experiment 1 thus indicated that by 17 mo of age, infants already view intervening in within-group transgressions as one of the responsibilities of group leaders.

Experiment 2

In experiment 2, we sought to confirm the results of experiment 1 and to provide converging evidence for our conclusions by using the physical cue of relative size, rather than the behavioral cue of verbal control, to mark leadership. Anthropological evidence (21, 54) indicates that traditional leaders "often wear robes that greatly expand their apparent size and coiffures or headgear that make them appear taller" (21). There is also experimental evidence that 10- to 16-mo-old infants expect a larger character to have the right-of-way over a smaller character when crossing a narrow platform (37). We built on these findings in designing our manipulation. Infants ($n = 48$) were randomly assigned to a leader or a nonleader condition and received 1 test trial in which they saw an intervention or nonintervention event. In the leader condition, these events were identical to those in experiment 1 except that the protagonist was taller and wore larger overalls and a taller hat than the side bears (Fig. 3; for a fuller depiction, see *SI Appendix*, Fig. S1). In the nonleader condition, these events were identical to those in experiment 1 and again involved 3 similar-sized bears wearing similar-sized overalls and hats. The 2 conditions thus differed only in the protagonist's size; if infants could use this cue to determine whether the protagonist was a leader or a nonleader equal in standing to the side bears, then results should be the same as in experiment 1.

Looking times during the final phase of the test trial (Fig. 2) were log-transformed and analyzed as in experiment 1. This analysis yielded only a significant condition × event interaction, $F(1,44) = 6.00$, $P = 0.018$, $\eta_p^2 = 0.12$. Planned comparisons revealed that infants in the leader condition looked significantly longer if shown the nonintervention event (M = 21.43, SD = 9.75) as opposed to the intervention event (M = 13.07, SD = 7.88), $F(1,44) = 7.78$, $P = 0.008$, $d = 1.07$, whereas infants in the nonleader condition looked about equally at the nonintervention (M = 15.68, SD = 7.50) and intervention (M = 16.90, SD = 5.31) events, $F(1,44) = 0.46$, $P = 0.503$, $d = -0.30$. Wilcoxon rank-sum tests confirmed the results of the leader ($Z = 2.28$, $P = 0.023$) and nonleader ($Z = -0.61$, $P = 0.544$) conditions.

The results of experiment 2 thus confirmed and extended those of experiment 1. When the protagonist was identified as a group leader, infants expected her to intervene following the wrongdoer's transgression, and this was true whether her leadership was established via the behavioral cue of verbal control (experiment 1) or the physical cue of relative size (experiment 2).

Fig. 3. Test events in the leader condition of experiments 2 and 3 began as shown here, and then continued as in rows 4 and 5 of Fig. 1, with the larger red bear.

When the protagonist was identified as a nonleader equal in standing to the other members of the group, however, infants held no particular expectation as to whether she would intervene or not. Together, experiments 1 and 2 thus provided converging evidence that by 17 mo of age, infants already expect leaders to right wrongs within their groups.

Additional Analyses

To compare the test responses of infants in experiments 1 and 2 ($n = 96$), we conducted another ANOVA similar to that in experiment 1, with experiment (1, behavioral cues; 2, physical cues) as an additional between-subject factor. The main effect of experiment was significant, $F(1,88) = 4.72$, $P = 0.033$, $d = 0.42$, with infants looking longer in experiment 2 (M = 16.77, SD = 8.12) than in experiment 1 (M = 13.78, SD = 8.01). This is most likely due to experimental fatigue as infants in experiment 1 received 2 familiarization trials before the test trial, whereas infants in experiment 2 received none. Importantly, no interactions including the experiment factor were significant, all Fs$(1,88) \leq 0.15$, confirming that infants responded similarly to the intervention and nonintervention events whether leadership was established using behavioral or physical cues. As before, the condition × event interaction was significant, $F(1,88) = 14.03$, $P < 0.001$, $\eta_p^2 = 0.14$. Across both experiments, infants in the leader condition looked significantly longer if shown the nonintervention event (M = 20.47, SD = 10.63) as opposed to the intervention event (M = 11.42, SD = 5.97), $F(1,88) = 14.89$, $P < 0.001$, $d = 1.07$, whereas infants in the nonleader condition looked about equally at the nonintervention (M = 13.52, SD = 6.97) and intervention (M = 15.69, SD = 5.55) events, $F(1,88) = 2.07$, $P = 0.154$, $d = -0.43$. Wilcoxon rank-sum tests confirmed the results of the leader ($Z = 3.27$, $P = 0.001$) and nonleader ($Z = -1.51$, $P = 0.132$) conditions.

Because infants in experiments 1 and 2 saw a similar paused scene at the end of the test trial, with the wrongdoer and the victim looking down at their placemats on either side of the apparatus, we could explore whether infants looked equally or differentially at the 2 characters. The test data from the 2 experiments were pooled, and a naive coder reviewed each infant's recorded session to code frame-by-frame how long the infant looked at each side bear during the paused scene (only 90 of 96 infants could be included in this analysis; see *Methods*); videotaped sessions were edited so the coder did not know the infant's condition. Looking times (in seconds; Fig. 4) were log-transformed and analyzed using an ANOVA with condition (leader, nonleader) and event (intervention, nonintervention) as between-subject factors and character (wrongdoer, victim) as a within-subject factor. The analysis yielded a significant main effect of character and significant condition × event and event × character interactions, all Fs$(1,86) \geq 7.36$, $P \leq 0.008$, as well as a significant condition × event × character interaction, $F(1,86) = 9.07$, $P = 0.003$, $\eta_p^2 = 0.10$. Four follow-up contrasts (with a Bonferroni-adjusted α-level of 0.05/4 = 0.0125) revealed that 1) in the leader condition, infants who saw the nonintervention event looked significantly longer at the wrongdoer (M = 10.25, SD = 5.46) than at the victim (M = 5.87, SD = 4.52), $F(1,86) = 28.48$, $P < 0.001$, Cohen's $d_z = 1.05$, whereas infants who saw the intervention event looked equally at the 2 characters, $F(1,86) = 1.13$, $P = 0.291$, $d_z = -0.19$ (wrongdoer: M = 4.32, SD = 2.94; victim: M = 4.47, SD = 2.34), and 2) in the nonleader condition, infants looked equally at the 2 characters in each event, both Fs$(1,86) \leq 0.53$, $P \geq 0.469$, $d_z \leq 0.17$ (nonintervention, wrongdoer: M = 5.20, SD = 2.82; victim: M = 4.72, SD = 3.45; intervention, wrongdoer: M = 6.93, SD = 3.85; victim: M = 6.05, SD = 2.42). In the leader condition, 20 of 23 infants who saw the nonintervention event looked longer at the wrongdoer than at the victim ($P < 0.001$, cumulative binomial probability), but only 10 of 23 infants who saw the intervention event did so ($P = 0.798$); this difference was significant ($P = 0.005$, Fisher's exact test). The corresponding numbers in the nonleader condition were 13 of 21 ($P = 0.192$) and 13 of 23 ($P = 0.339$), and they were not significantly different ($P = 0.767$, Fisher's exact test).

In the final phase of the nonintervention event, infants in the leader condition looked significantly longer at the wrongdoer than at the victim. This was not due to a tendency to look longer at the bear who had transgressed, the bear who had 2 toys, or the bear who was approached first by the protagonist, because this effect was not found in the nonleader condition. Rather, infants attempted to make sense of the leader's unexpected decision not to intervene and reasoned that she might have perceived the risk of retaliation by the wrongdoer to be particularly high. This inference, in turn, led infants to show sustained vigilance toward the wrongdoer, as even the leader seemed to be wary of her (for a discussion of vigilance toward wrongdoers in infants, see ref. 41).

Experiment 3

We have argued that infants in experiments 1 and 2 expected the leader to intervene because 1) they perceived the wrongdoer's actions as a fairness and ingroup-support transgression and assumed the leader did too, and 2) they held an abstract expectation that leaders have role-based responsibilities that include intervening in within-group transgressions. This analysis predicted that if taking both toys no longer constituted a transgression, infants' expectation about the leader's actions would change. Experiment 3 tested this prediction.

Infants ($n = 24$) saw intervention and nonintervention events identical to those in the leader condition of experiment 2, with a single exception: The "victim" announced that she did not want a toy, thus making it acceptable for the "wrongdoer" to take both

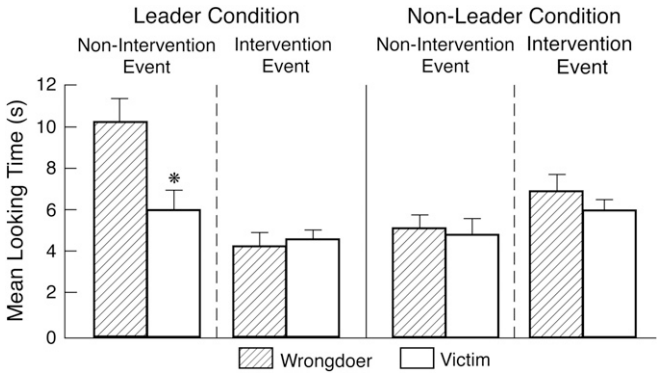

Fig. 4. Mean looking times at the wrongdoer and victim collapsed across experiments 1 and 2 (n = 90). Error bars represent SEM, and an asterisk denotes a significant difference between the 2 characters ($P < 0.05$).

toys (Fig. 3; for a fuller depiction, see *SI Appendix*, Fig. S2). After the protagonist announced "Toys!", the "wrongdoer" responded excitedly "Yay!" and the "victim" said "No, thanks!" while shaking her head. Next, the protagonist said "Go ahead!". The "wrongdoer" quickly moved forward, took both toys, and brought them back to her placemat, while the "victim" simply looked down at her placemat, again communicating her disinterest in the toys. From that point on, the events proceeded exactly as in experiment 2: The protagonist either redistributed a toy from the "wrongdoer" to the "victim" (intervention event) or inspected each placemat in turn without redistributing a toy (nonintervention event). Evidence that infants now looked significantly longer if shown the intervention as opposed to the nonintervention event would indicate that infants held different expectations for the leader's actions when a transgression occurred (the victim wanted a toy, but the wrongdoer unfairly seized both toys; experiments 1 and 2) and when no transgression occurred (the "victim" did not want a toy, so the "wrongdoer" was free to take both toys; experiment 3). Such a finding would make clear that infants in experiments 1 and 2 expected the leader to intervene, not because leaders seek to display their power or impose certain outcomes on others, but because leaders have a responsibility to protect their followers when the need arises.

Looking times during the final phase of the test trial (Fig. 2) were log-transformed and analyzed using an ANOVA with event (intervention, nonintervention) as a between-subject factor. This analysis indicated that infants looked significantly longer if shown the intervention event (M = 18.21, SD = 8.20) than if shown the nonintervention event (M = 8.48, SD = 3.76), $F(1,22) = 21.92$, $P < 0.001$, $d = -1.91$. A Wilcoxon rank-sum test confirmed this result ($Z = -3.35$, $P < 0.001$). Thus, infants detected a violation when the leader redistributed a toy even though the "victim" had made it clear that she did not want a toy.

In another analysis, we compared the test responses of infants in experiment 3 with those of infants in the leader condition of experiment 2; recall that the only difference between these 2 conditions was in whether the seizure of the 2 toys constituted a transgression (experiment 2) or not (experiment 3). Looking times were analyzed using an ANOVA with experiment (2, 3) and event (intervention, nonintervention) as between-subject factors. The analysis yielded only a significant experiment × event interaction, $F(1,44) = 24.21$, $P < 0.001$, $\eta_p^2 = 0.36$, indicating that infants' responses to the 2 events varied by experiment. To complement the planned comparisons reported earlier, we compared infants' responses to each event in the 2 experiments. As expected, for the nonintervention event, infants in experiment 2 looked significantly longer than those in experiment 3, $F(1,44) = 23.19$, $P < 0.001$, $d = 2.15$, whereas for the intervention event, the reverse pattern was found, $F(1,44) = 4.59$, $P = 0.038$, $d = -0.81$.

Finally, since experiment 3 had neither a wrongdoer nor a victim, there was no clear reason for infants to look differentially at the 2 characters during the paused scene at the end of the test trial. Indeed, an ANOVA with event (intervention, nonintervention) as a between-subject factor and character (wrongdoer, victim) as a within-subject factor yielded only a significant main effect of event, $F(1,21) = 17.10$, $P < 0.001$, as reported above. Neither the main effect of character nor the event × character interaction was significant, both Fs$(1,21) \leq 2.43$, $P \geq 0.134$, suggesting that infants tended to look equally at the 2 characters in each event (nonintervention, wrongdoer: M = 3.73, SD = 1.82; victim: M = 2.80, SD = 1.61; intervention, wrongdoer: M = 7.50, SD = 6.35; victim: M = 7.23, SD = 3.46).

When the "victim" indicated that she did not want a toy, infants detected a violation in the intervention event, as though they viewed it as overbearing for the leader to redistribute one of the toys to the "victim" despite her expressed wishes. This result and those of experiments 1 and 2 make it clear that infants do not simply expect leaders to display their power or impose particular outcomes regardless of circumstances. An intervention intended to ensure a fair distribution of resources is expected when the situation calls for it (i.e., one follower did not get a fair share), but it becomes meddlesome when the situation does not call for it (i.e., one follower did not want a share). In sum, infants in the present experiments expected the leader to intervene when one of her followers was the victim of a transgression, but not otherwise.

General Discussion

Our research examined whether infants assign unique responsibilities to group leaders. Building on evidence from across the social sciences that leadership is often associated with within-group conflict resolution, we asked whether infants would expect a leader who observed a within-group transgression to intervene, but would hold no particular expectation for intervention from a nonleader who observed the same transgression. In experiments 1 and 2, 17-mo-olds watched interactions among a group of 3 bear puppets. To start, the middle bear (the protagonist) introduced 2 toys for the side bears, who made it clear that they wanted a toy ("Yay, yay!"). Next, one side bear (the wrongdoer) seized both toys, leaving none for the other side bear (the victim). In the intervention event, the protagonist then redistributed one of the toys from the wrongdoer's placemat to the victim's placemat; in the nonintervention event, the protagonist approached each placemat in turn without redistributing a toy.

When the protagonist was portrayed as a leader, infants looked significantly longer if shown the nonintervention as opposed to the intervention event, and this was true regardless of whether leadership was marked using verbal control (experiment 1) or relative size (experiment 2). However, this effect was reversed if the "victim" made it clear that she did not want a toy ("No, thanks!"), so that the leader's intervention was no longer called for (experiment 3). Together, these results 1) provide further evidence that infants can detect leadership-based power asymmetries, using a variety of cues, and 2) extend prior findings that infants hold expectations about how followers will act toward their leaders (33) by revealing complementary expectations about how leaders will act toward their followers. In line with prior evidence (reviewed in the Introduction) that leadership in human groups is closely associated with enforcing norms and resolving within-group conflicts, infants expected the leader to intervene when a transgression occurred among her followers. Critically, this intervention allowed the leader to fulfill her responsibilities toward her followers but otherwise presented no immediate advantage for her: Taking one of the toys away from the wrongdoer was potentially costly as the wrongdoer might choose to challenge this intervention and retaliate, and redistributing a toy to the victim directly benefited the victim rather than the leader. Evidence that infants in experiments 1 and 2 might have considered possible costs to the leader came from the finding that at the end of the test trial, infants who saw the

nonintervention event looked significantly longer at the wrongdoer than at the victim (this effect was eliminated in the intervention event). These results suggest that infants inferred that the wrongdoer was potentially dangerous, as even the leader appeared to be wary of her, and they therefore showed vigilance toward her.

When the protagonist was portrayed as a nonleader (nonleader condition), infants in experiments 1 and 2 looked equally at the nonintervention and intervention events, suggesting that they held no particular expectation for intervention from the nonleader. These results relate to 2 sets of prior findings. First, we saw in the Introduction that in the absence of group and power cues, 6-mo-olds looked equally whether protagonists who had witnessed a harm transgression chose to intervene or not (38). Our research shows that infants respond similarly when nonleaders witness a within-group fairness transgression: It is only leaders who are expected to intervene. These results dovetail with the findings in adults discussed in the Introduction (23, 24, 28–30) and also echo findings from natural field experiments in large European and North American cities in which adult passersby in train or subway stations observed littering by a confederate wrongdoer (55–58). Rates of interventions (e.g., verbal reprimands) tended to be low, ranging from about 4 to 17% across cities, and were modulated by various factors, including the wrongdoer's sex (56) and minority status (58). These results were not simply due to passersby' indifference to littering transgressions: In a survey conducted in an Athens subway (55), over 90% of respondents stated that they would be bothered by seeing a wrongdoer violate the nonlittering norm in the subway; nevertheless, over 70% admitted that they would be unlikely to confront the wrongdoer, due to fear of retaliation. The authors concluded that for most respondents, confrontation was perceived to be costly and to exceed its benefits. Together with the present results, these findings support the view that beginning early in life, interventions 1) are expected for leaders who observe within-group transgressions, as their position of leadership protects them somewhat from the risk of retaliation, but 2) are considered optional for nonleaders who observe within-group transgressions and for individuals who observe anonymous transgressions. Second, the results of the nonleader condition also bear on recent findings that 13- and 29-mo-olds expected a nonleader who had observed a transgression against an ingroup victim to engage in indirect third-party punishment toward the wrongdoer, by withholding help (50). Following the transgression, while the nonleader watched, the wrongdoer worked at a task and needed instrumental assistance to complete it. Children detected a violation if the nonleader chose to help the wrongdoer (e.g., by bringing a needed but out-of-reach object closer), and this effect was eliminated if no transgression occurred, if the nonleader did not witness the transgression, or if the victim was not clearly identified as a member of the nonleader's group. Together with the present results, these findings suggest that while nonleaders are not expected to engage in direct third-party punishment toward wrongdoers, they are expected to engage in indirect third-party punishment, to signal that transgressions against the group have adverse consequences and thus help deter future transgressions (for related findings in adults, see refs. 56 and 59–61).

Our findings suggest several directions for future research. Some of these directions will help make clear the range of conditions under which infants do and do not expect interventions. First, we have proposed that infants viewed the 3 bears as members of the same group and expected an intervention when the leader witnessed a transgression between her group members. This analysis suggests that if the wrongdoer and the victim belonged to a different group than the leader, infants might now look equally whether the leader intervened or not. Evidence that infants expected an intervention when a tall bear observed a transgression between 2 small bears, but not between 2 small rabbits, would suggest that infants view a leader's responsibility to rectify transgressions as pertaining mainly to her own group (for related findings in adults, see refs. 30 and 62).

Second, we have argued that infants expected the protagonist to intervene when they identified her as a leader, with role-based responsibilities to her group. This analysis suggests that if the leader was replaced with a different type of powerful individual, such as a bully, infants might no longer expect an intervention. In the experiment on obedience discussed in the Introduction (33), infants held no particular expectation about whether the characters would continue to obey the bully after she left the scene. In a similar vein, the familiarization trials in experiment 1 could be modified to show a bully protagonist who hit the other bears and stole their toys. If infants now looked equally at the intervention and nonintervention events, this would indicate that infants do not endue all powerful individuals with a responsibility to intervene in transgressions, but only those they perceive to be legitimate leaders.

Third, we have suggested that infants view interventions in within-group transgressions 1) as optional for nonleaders due to the possible risk of retaliation, but 2) as required for leaders despite this risk (as though leaders are somewhat protected from counterpunishment by their mantle of authority). Based on this analysis, one could ask whether infants would expect a nonleader to intervene under less threatening circumstances. For example, infants could see test events identical to those in experiment 1 except that after seizing the 2 toys, the wrongdoer would announce that she had to go away briefly and would then leave the scene. Evidence that infants now detected a violation in the nonintervention event would suggest that infants do expect nonleaders to take advantage of low-cost opportunities to punish transgressions against ingroup victims (including indirect forms of third-party punishment, as discussed above). Conversely, one could also ask whether infants would still expect the leader to intervene under more threatening circumstances. Imagine that infants saw familiarization and test events identical to those in experiment 1 except that the wrongdoer not only took both toys but also hit the victim. If infants still detected a violation in the nonintervention event, it would indicate that for infants, a leader is expected to confront even wrongdoers who might inflict significant harm.

Finally, another important research direction will be to explore how infants conceptualize leaders and their responsibilities to followers. A first possibility, alluded to in the Introduction, is that infants' reasoning about leaders has rich evolutionary roots (5–22). Several researchers (1, 13, 21, 22, 63, 64) have suggested that the "first draft" of human moral cognition includes not only abstract expectations of fairness, harm avoidance, and ingroup support but also an abstract expectation of authority [these expectations are thought to emerge early and universally in development, and to be revised by experience and culture in subsequent "drafts" of moral cognition (22)]. For example, Rai and Fiske (13) proposed that authority ranking is one of the basic relational models underlying human social interactions and that it carries moral obligations for both authority figures and followers: Authority figures are morally obligated "to lead, guide, direct, and protect" their followers, while followers are morally obligated "to respect, obey, and pay deference" to their authority figures. A second possibility is that infants' reasoning about leaders reflects primarily behavioral rules acquired through various mechanisms, including statistical learning mechanisms, mechanisms that support social heuristics that are advantageous in daily life, and socialization processes that help children internalize the norms of their social environments (65–67). To explain the present findings from this perspective, it could be suggested that infants in the second year of life often experience situations similar to the situation studied here; for example, they may notice that parents and daycare teachers generally insist on the fair sharing of toys or food items among potential recipients and intervene promptly when transgressions occur. Over time, such repeated experiences could lead to the acquisition of behavioral rules about leaders (e.g., they typically intervene in within-group transgressions).

Future research can evaluate these possibilities in at least 2 ways. One will be to examine whether infants in the second or even the first year of life already hold a rich array of expectations about leaders' responsibilities, beyond that of intervening in

within-group conflicts. For example, would infants also expect leaders to protect their followers from outgroup aggressors, to assist in emergencies, and to be fair and impartial in regulating access to scarce resources (12, 14, 68–70)? The younger the age at which such expectations can be observed, and the richer and more varied they are, the more compelling will be the conclusion that an abstract expectation of authority guides early reasoning about leaders. The other way will be to adapt the social-preference measure used by Kanakogi et al. (38). Based on their results, we would expect infants to show a preference for a leader who intervened over one who did not, and for a nonleader who intervened over one who did not. Importantly, our results suggest that infants might also prefer a nonleader who did not intervene over a leader who did not intervene (the leader would be shirking her responsibilities), as well as a nonleader who intervened over a leader who intervened (because the nonleader was not obligated to intervene, her doing so could be taken as evidence of her courage or virtuous willingness to go beyond what was expected). Positive results in these 2 lines of research would not mean, of course, that experience plays no role in the development of infants' knowledge about leaders. Cultures vary in how leaders and followers interact (e.g., what cues mark leaders, what behaviors express deference to leaders), and children must learn these conventions to skillfully navigate their social environments (12, 21, 51, 52, 71–74). In addition, children may have the misfortune of being exposed to leaders who abuse their position of power to exploit their followers, and they must then learn to cope with these immoral leaders.

In sum, the present results indicate that infants already ascribe unique responsibilities to leaders, including that of righting wrongs. As such, our results support long-standing claims that an abstract expectation of authority is part of the basic structure of human moral cognition.

Methods

Power Analysis. In a prior report (47) that also examined sociomoral expectations in 17-mo-olds using a 2 × 2 between-subject design with live events, the average condition × event effect size (η_p^2) ranged from 0.17 to 0.21 across experiments. An a priori power analysis using G*Power (75) based on the lower value indicated that, with power set at 0.80 and alpha set at 0.05, the minimum number of participants per cell (i.e., per combination of condition and event) was 10 to 11; in line with this analysis, we used 12 infants per cell.

Participants. Participants were 120 healthy term infants (58 male; M = 17 mo, 15 d; range = 16 mo, 3 d to 18 mo, 28 d). Another 21 infants were excluded because they were fussy (7), distracted (3), or active (1); because their test looking time was over 3 SDs from the condition mean (n = 1, in the leader condition of experiment 1); or because they looked for the maximum time allowed in the test trial (n = 9, 4 in the leader conditions and 5 in the nonleader conditions of experiments 1 and 2). In each experiment, written informed consent was obtained from each infant's parent before the test session, and all protocols were approved by the University of Illinois Institutional Review Board.

Apparatus and Stimuli. The apparatus consisted of a brightly lit display booth (201 cm high × 101 cm wide × 58 cm deep) with a large opening (54 cm × 95 cm) in its front wall; between trials, a hidden supervisor lowered a curtain in front of this opening. Inside the apparatus, the side walls were painted white and the back wall was covered with pastel adhesive paper. Three female experimenters worked together to produce the events; each wore a cream shirt, sat on one of the 3 sides of the apparatus, and operated a bear puppet. Each bear had a hat and matching-colored overalls in red, blue, or yellow. The middle bear was dressed in red and entered the apparatus via a window (28 cm high × 51 cm wide) in the back wall that was filled with a semitransparent beige fabric (this allowed the experimenter to see into the apparatus well enough to produce the scripted actions). The other bears stood at windows in the side walls (each 51 cm × 38 cm and filled with a fringed white curtain); in front of each side bear was a beige placemat (0.75 cm × 13 cm × 23 cm). In experiment 1, the 3 bears were identical in size (each was about 30 cm × 18 cm × 12 cm at the largest points); in the leader condition of experiments 2 and 3, the middle bear wore a taller hat and longer overalls, making it about 1.5-fold taller (45 cm × 18 cm × 12 cm). Test stimuli included a wooden tray with a vertical handle for easy handling and 2 shiny green cubes. To avoid producing auditory cues about which test event was shown, the cubes had felt on their bottom surfaces, and the placemats were also covered with felt. In experiment 1, familiarization stimuli included 6 pompoms, a clear box for storing them, and a picture book. During each testing session, one camera captured an image of the events and another camera captured an image of the infant. The 2 images were combined, projected onto a computer monitor behind the apparatus, and watched by the supervisor to confirm that events followed the prescribed scripts. Recorded sessions were also checked offline for accuracy.

Procedure. Infants sat on a parent's lap, and parents were instructed to remain silent and close their eyes during the test trial. Two hidden observers monitored each infant's looking behavior, and the primary observer's responses were used in the analyses. Observers were naive about the infant's test event (experiments 1 to 3) and condition (experiments 1 and 2); the primary observer's guesses about these after the testing session were 49% and 48% correct, respectively (both Ps > 0.694, cumulative binomial probability). In experiment 1, infants were highly attentive during the 2 computer-controlled familiarization trials, looking, on average, for 99% of each trial. Across experiments, infants were also highly attentive during the initial phase of the test trial, looking, on average, for 99% of the initial phase. The final phase of the test trial ended when infants either looked away for 1 consecutive second after having looked for at least 5 cumulative seconds or looked for a maximum of 45 cumulative seconds; the 5-s minimum value allowed infants to continue processing the test event before the trial could end. Interobserver agreement in the final phase of the test trial (calculated by dividing the number of 100-ms intervals in which the observers agreed by the total number of intervals in the final phase) averaged 96% across experiments. In each experiment, preliminary analyses of the test data revealed no interactions of condition and event (experiments 1 and 2) or event (experiment 3) with sex, wrongdoer identity (yellow or blue), or wrongdoer position (left or right), all Ps ≥ 0.213; subsequent analyses thus collapsed across the latter 3 factors (the data for all 3 experiments are provided in Dataset S1).

Coding. In each experiment, we coded where infants looked (left bear and placemat, right bear and placemat, or away) during the paused scene at the end of the test trial; 25% of the infants in each experiment were also coded independently by a second naive coder, who agreed on 95% of coded video frames. For each infant, looking times to the wrongdoer and the victim were converted to seconds (30 frames = 1 s), log-transformed, and analyzed as described in the text. Across experiments, 7 infants were excluded from these analyses, 6 due to technical difficulties (e.g., the infant's eyes were not visible in the videotape) and 1 because the difference in his looking times at the 2 characters was over 3 SDs from the condition mean.

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