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Research Report

Eighteen-Month-Old Infants Show Increased Helping Following Priming With Affiliation

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ABSTRACT—*We show that the mere hint of affiliation dramatically increases prosocial behavior in infants. Eighteen-month-old infants helped a person in need more often, and more spontaneously, when primed with photographs evoking affiliation than when primed with photographs evoking individuality. This study demonstrates that social primes can have an influence on infant behavior, and so opens up a wealth of possibilities for future research. In addition, these data have wide-ranging practical implications, suggesting that subtle changes to the social environment can promote prosocial behavior in children.*

Throughout our evolutionary history, group living has been critical to our survival. Many mammals depend on groups in order to survive, but in humans, this dependence has swelled to unprecedented levels (Brewer, 2004). The extent of our dependence on the group has had a profound influence on our cognition and behavior. Most notably, it has created a tendency for us to engage in behaviors that benefit our group members, that is, prosocial behaviors such as helping and sharing (Gintis, Bowles, Boyd, & Fehr, 2003). Yet, prosocial behavior also incurs a cost: In order to be helpful, for example, an individual must sacrifice both time and resources in pursuit of another's survival (Trivers, 1971). Thus, we may expect there to be direct connections between a sense of affiliation to the group and the tendency to adopt a prosocial orientation: When affiliation to the group is important, people should be helpful and cooperative; when individual action is important, people should be less inclined to be helpful. These connections may be so basic that they are automatic and implicit, and present early in development.

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Priming is one method used to investigate implicit connections of this kind. For example, Bargh, Chen, and Burrows (1996) presented adult participants with words that were either related to the elderly stereotype (e.g., *old*, *wrinkled*) or were not (e.g., *thirsty*, *clean*). Participants given the elderly prime subsequently walked more slowly down the corridor than participants given the neutral prime. More to the point, priming has shown connections between affiliation and affiliative (if not prosocial) behaviors. For example, adults primed with words related to affiliation (e.g., *friend*, *together*) are more likely to mimic the mannerisms of a model than participants given a neutral prime (Lakin & Chartrand, 2003).

In the study described here, we tested whether connections between affiliation to the group and prosocial behaviors are so fundamental that they are seen even in infants. In doing so, we also tested whether infants are susceptible to the influence of social primes at all. We know from previous studies that, if an adult is unable to reach an object he wants, 18-month-old infants will often pick up the object themselves and offer it to the adult (Warneken & Tomasello, 2006). In the current study, we primed 18-month-old infants with photographs evoking affiliation (two small dolls standing next to each other in the background of photographs of other objects) and measured the influence of the primes on infants' tendency to be helpful. We compared the helping responses of infants in this "together" prime condition to the responses of infants in three other conditions. First, we compared the together condition to a condition in which infants were primed with individuality or "aloneness." In this condition, infants saw a single doll standing in the background of otherwise identical photographs. We predicted that infants primed with affiliation would be more likely to later help an experimenter than infants primed with individuality. Second, to see whether the affiliation primes increase helping (or whether the individual primes decrease it), we included a measure of infants' baseline tendency to help: a condition in which the doll primes were replaced with two neutral, nonsocial

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stimuli (small stacks of blocks). Finally, to determine which aspects of the affiliation primes increase helpfulness, we compared the together condition to a condition in which there were also two dolls, but this time standing in a nonaffiliative relation to each other: back-to-back. This condition was designed to determine whether it is the mere presence of two dolls or their affiliative interaction that increases helpfulness.

METHOD

Participants

Participants were sixty 18-month-old infants (age range = 18 months 0 days to 18 months 29 days; 27 boys, 33 girls) recruited from a database of parents who had volunteered to participate in child development studies. Fifteen infants participated in each condition. An additional 7 infants were tested but excluded from analyses for parental interference ($n = 3$), crying during the test ($n = 2$), experimenter error ($n = 1$), and refusal to observe some of the photographs ($n = 1$).

Design and Materials

Infants were shown one of four sets of eight color photographs (28.5 × 19 cm), each of which contained a familiar household object (e.g., a teapot, book, or shoe) and a prime. In each case, the household object appeared in the foreground and the prime appeared in the background. In the together condition, each prime consisted of two small wooden dolls facing each other in close proximity. In the alone condition, each prime consisted of a single wooden doll standing by itself. In the baseline condition, each prime consisted of two small stacks of blocks roughly the same size as the dolls. In the back-to-back condition, each prime consisted of two wooden dolls facing in opposite directions (see Fig. 1 for an example from each condition). The eight photographs were identical in the four conditions except for the primes, and were presented in the same order for all infants. In half the photographs, the primes appeared to the right of the foreground object; in the other half, the primes appeared to the left of the foreground object. In the together condition, various combinations of dolls were used, with each pair being drawn from a possible set of six dolls. Two sets of photographs were used in the alone condition: For any given picture, half the infants saw the doll from the right side of the together picture, and half the infants saw the doll from the left side of the together picture. In the baseline condition, each photograph contained a unique configuration of four colored blocks. Finally, in the back-to-back condition, each photograph contained the same dolls as in the together condition, but rotated so that they faced away from each other. Note that the same proportion of the dolls' facial features was visible in the together and back-to-back conditions.

To assess infants' mood, immediately after the presentation of the primes, we asked parents to complete a mood evaluation consisting of three scales: happy-sad, good-bad, and cheerful-

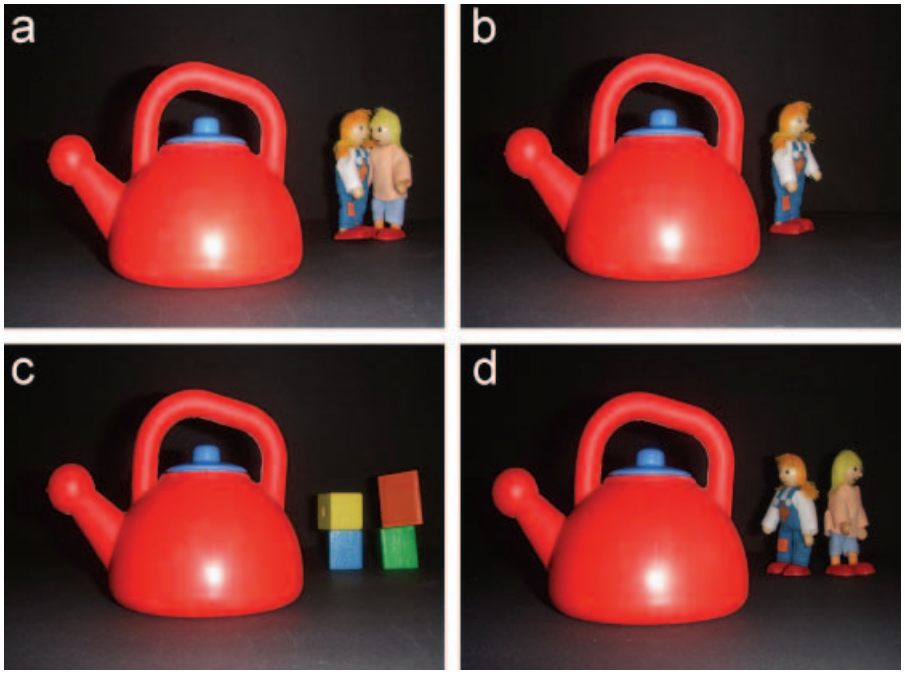

Fig. 1. Sample priming photographs from the (a) together condition, (b) alone condition, (c) baseline condition, and (d) back-to-back condition. Each image consisted of a household object in the foreground and the prime in the background. In the together condition, each prime consisted of two small wooden dolls facing each other in close proximity. In the alone condition, each prime consisted of a single wooden doll standing by itself. In the baseline condition, each prime consisted of two small stacks of blocks roughly the same size as the dolls. In the back-to-back condition, each prime consisted of two wooden dolls facing in opposite directions.

gloomy. Scores on each scale ranged from 0 (*negative*) to 7 (*positive*; scale adapted from van Baaren, Holland, Kawakami, & van Knippenberg, 2004).

Procedure

After a brief warm-up play phase with the experimenter and an assistant (identical in all conditions), each infant was shown the eight photographs in turn by the assistant following a predefined script. For each photograph, the assistant named the foreground object and then commented on its color and finally its function, completely ignoring the prime. During this time, the experimenter sat in the opposite corner of the room, with her back to the interaction, reading (this ensured that she was unaware of the condition to which infants had been assigned). After the presentation of the photographs, the assistant asked infants to play with the experimenter and turned away from the interaction to read. While infants waited, the experimenter momentarily left the room and returned with a bundle of six small sticks, which she "accidentally" dropped on the floor while kneeling down at a small table (for a similar helping task, see Macrae & Johnston, 1998). To give infants the opportunity to help spontaneously, during the first 10 s after dropping the sticks, the experimenter said nothing—she simply alternated her gaze between the fallen sticks and the infants' faces. During the next 10 s, if infants had not already begun helping, the experimenter looked toward them, called their name, and said, "My sticks, they've fallen on the floor," making two unsuccessful attempts to reach the sticks herself. During the next 10 s, the experimenter looked at the infants, called their name, and said, "My sticks, I need them back," making two more attempts to reach the sticks. During the final 10 s, the experimenter looked at the infants and said, "Please will you help me?" while holding out her hand, palm up.

Coding

The main dependent measure was whether infants helped the experimenter spontaneously, that is, whether they picked up at least one stick and offered it to her within the first 10 s of the test phase (before she spoke to the infants or reached for the sticks herself). In addition, a more general measure of helping was scored if infants picked up at least one stick and offered it to the experimenter at any point during the test phase (i.e., including after she asked for help). To assess interrater reliability, a randomly chosen 20% of the videotapes were scored independently by a rater blind to condition and experimental hypothesis. Agreement was perfect for both measures (Cohen's $\kappa = 1.00$).

RESULTS

Figure 2 presents the percentage of infants who helped the experimenter both spontaneously (within the first 10 s of the test phase) and overall. Three times as many infants helped spontaneously in the together condition as in each of the other three conditions. Because the percentage of infants who helped in the three control conditions was identical, and the expected values in our 2×4 contingency table were low, we pooled across these three conditions and compared them to the together condition. Infants were significantly more likely to spontaneously help the experimenter in the together condition than in the pooled control conditions, $\chi^2(1, N = 60) = 8.57$, two-tailed $p = .003$, $p_{rep} = .97$, $\varphi = .38$.

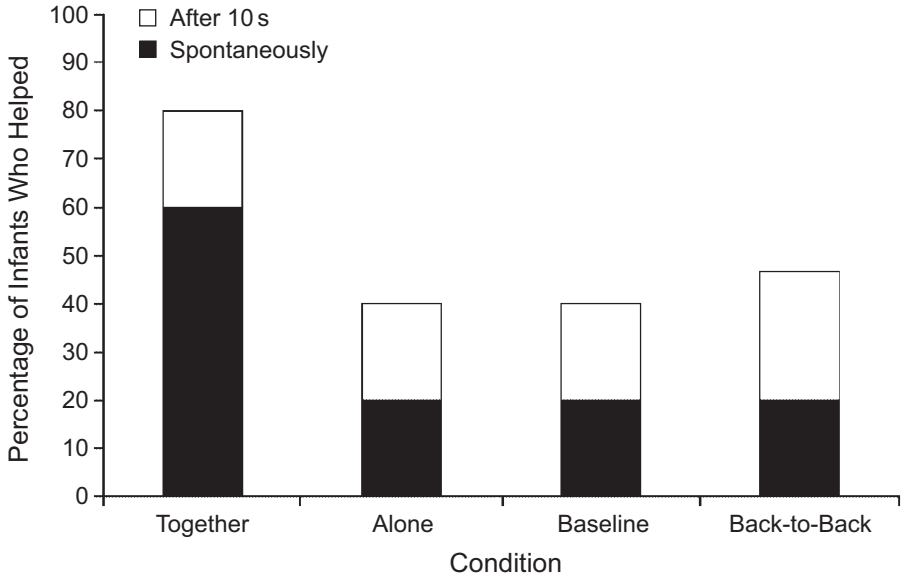

Fig. 2. Percentage of infants who helped the experimenter spontaneously (i.e., during the first 10 s) and during the rest of the test phase (i.e., including after prompting) in each of the four conditions.

Similar results were found when the infants who helped the experimenter at any point during the test phase were included in analyses. Again, infants were significantly more likely to help in the together condition than in the pooled control conditions, $\chi^2(1, N = 60) = 6.43$, two-tailed $p = .011$, $p_{rep} = .95$, $\varphi = .33$. There were no significant differences between the three control conditions, $\chi^2(2, N = 45) = 0.18$, $p = .91$, $p_{rep} = .17$.

To ascertain whether infants paid equal attention to the presentation of the primes in each condition, we randomly selected a third of the infants from each condition and coded the number of seconds they spent looking at the photographs. There were no significant differences between conditions, $F(3, 16) = 1.58$, $p = .23$, $p_{rep} = .70$. The average number of seconds spent looking at the photographs was 102.2 in the together condition, 92.8 in the alone condition, 89.6 in the baseline condition, and 101.4 in the back-to-back condition.

There were also no significant differences in infants' mood across the four conditions, $F(3, 56) = 0.155$, $p = .93$, $p_{rep} = .15$. The average rating of infants' mood was 5.04 in the together condition, 4.97 in the alone condition, 5.0 in the baseline condition, and 5.27 in the back-to-back condition. Thus, infants' increased helping in the together condition cannot be explained by differences in attentiveness or mood.

DISCUSSION

After having been exposed to affiliation primes, 18-month-old infants were three times as likely to spontaneously help an adult as after having been exposed to individuality primes. By comparing the results of the together condition to the baseline control condition, we can conclude that it was the affiliation primes that increased helping behavior rather than the individuality primes that decreased it. Moreover, by comparing the results of the together condition to the back-to-back condition, we can conclude that it was the affiliative stance depicted in the photographs, rather than the mere presence of two dolls, that increased helping. The connections between affiliation to the group and prosocial behavior are thus so fundamental that, even in infancy, a mere hint of affiliation is sufficient to increase helping.

This effect was produced through a surprisingly small manipulation: The only difference between the together and back-to-back conditions, for example, was whether infants saw the same two dolls facing toward or away from each other in the background of otherwise identical photographs. Furthermore, the angle at which the dolls were placed meant that infants in these two conditions were exposed to exactly the same proportion of the dolls' faces (that is, they saw the same number of eyes, and the same proportion of the dolls' smiles), thus controlling for possible effects of lower-level social stimuli on helping behavior. It is important to note that helpfulness itself was not primed: The dolls simply stood next to one another. Infants did not directly reproduce the situations depicted in the photographs; instead, the photographs triggered a general prosocial orientation that manifested itself in increased helping. Thus, infants made the subconscious connection between affiliation and helping behavior.

One possible objection to our account is that the rates of helping in our baseline control condition are somewhat lower than those reported in a previous helping study with 18-month-old infants (Warneken & Tomasello, 2006). This raises the possibility that our together condition represents a true baseline and the other three conditions depressed helping below baseline levels. However, a direct comparison between these two studies is complicated by some important differences in the procedures. For example, Warneken and Tomasello (2006) presented infants with many different helping tasks (and several trials within each task). Moreover, infants in their study had been interacting with the experimenter who needed help immediately before the test phase. In contrast, infants in our study were presented with only one chance to help and had been interacting with a different experimenter immediately before the test phase, which likely reduced their tendency to help across all four conditions. Thus, we think that the pattern of results across our different conditions is more informative than a comparison across studies.

These data have far-reaching implications for research. By demonstrating that infants are susceptible to the influence of social primes, this work provides a novel non-verbal method for developmental psychologists. Social priming in adults has been used as a means by which to understand a wide range of social processes including, but not limited to, cooperation (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001), affiliation (Lakin & Chartrand, 2003), aggression (Anderson, Benjamin, & Bartholow, 2002), intergroup attitudes (Spears, Gordjin, Dijksterhuis, & Stapel, 2004), and prejudice (Bargh et al., 1996). Currently, there is a great deal of interest in the development of inter- and intragroup cognition and behavior, with increasing focus on the developmental origins of conformity, in-group bias, and prejudice (e.g., Fusaro & Harris, 2008; Kinzler, Dupoux, & Spelke, 2007; Over & Carpenter, 2009). Our paradigm offers a new method through which these and other social processes can be studied in infants.

Equally intriguing are the practical implications of this research. We have shown the ease with which it is possible to dramatically increase prosocial behavior in infants. Our data suggest that surprisingly subtle changes to our social environment may promote prosocial behavior in our children.

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