FAST-TRACK REPORT

Priming third-party ostracism increases affiliative imitation in children

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Abstract

Human beings are intensely social creatures and, as such, devote significant time and energy to creating and maintaining affiliative bonds with group members. Nevertheless, social relations sometimes collapse and individuals experience exclusion from the group. Fortunately for adults, they are able to use behavioral strategies such as mimicry to reduce their social exclusion. Here we test whether children, too, increase their imitation following an experience of ostracism. Given humans' profound need to belong, we predicted that the mere hint of social exclusion – even third-party social exclusion – would be sufficient to increase affiliative imitation in 5-year-olds. As predicted, children primed with videos in which one shape was ostracized by a group of other shapes subsequently imitated the actions of a model more closely than children in a control condition. These findings highlight just how sensitive humans are to social exclusion and demonstrate that children, like adults, modify their social behavior in response to ostracism.

Introduction

Throughout our evolutionary history, group living has been critical to human survival (Brewer, 2007; Buss & Kenrick, 1998). Belonging to a group is so important to us that we go to great lengths to create in and out groups, for example through the way we dress and speak and in the cultural rituals in which we engage. Our reliance on the group has had at least two psychological consequences: first, we have a fundamental and pervasive drive to affiliate with our conspecifics (Baumeister & Leary, 1995; Lakin, Jefferis, Cheng & Chartrand, 2003), and second, we are exceptionally sensitive to cues which indicate a breakdown in affiliative relations (Spoor & Williams, 2007).

This drive to affiliate can be clearly seen in adults' tendency to subconsciously mimic the mannerisms of their group members. Indeed, the relation between subconscious mimicry and affiliation is bi-directional. First, mimicry has been shown to generate affiliation and rapport: participants who have had their mannerisms mimicked by a social partner rate the quality of their social interaction, as well as their social partner, more highly than participants who have not been mimicked (Chartrand & Bargh, 1999). Second, adults have been shown to increase their mimicry when affiliation is important to them. This is most clearly demonstrated in an experiment by Lakin and Chartrand (2003) in which participants were given either a conscious or a non-conscious goal to affiliate. After this goal induction,

participants watched a video in which a confederate performed mundane clerical tasks while repeatedly rubbing her face. Participants given either type of affiliation goal increased their tendency to mimic the mannerisms of the confederate relative to participants in a control group who were not given an affiliation goal.

However, despite our affiliative tendencies, social relations sometimes collapse and individuals are excluded from the group. Such exclusion has potentially devastating consequences for the individual (Spoor & Williams, 2007). One result of this is that adults are extremely sensitive to cues which indicate their social exclusion. For example, involvement in a relatively brief game in which two confederates neglect to throw a ball to a participant is sufficient to invoke feelings of sadness and exclusion in the participant (Williams & Sommer, 1997). The same effect holds when the other players are not even physically present: participants also feel sad when they are excluded from an online ball game (Williams, Cheung & Choi, 2000). In fact, a sense of ostracism can even be evoked without any interaction at all, through priming: participants who have been subliminally presented with words related to rejection (e.g. *ignored*, *dumped*, *abandoned*) during an unrelated computer task appraise themselves more negatively than participants who have been subliminally presented with words related to acceptance (e.g. *welcomed*, *attached*, *bonded*) (Sommer & Baumeister, 2002).

It follows that any behavior which could serve to reduce social exclusion would be highly beneficial for the

individual. One way in which adults may seek to repair social relations is through conformity to the opinions of the group. Williams *et al.* (2000) found that participants who were excluded from an online ball game were subsequently more likely to conform to the majority opinion in an Asch-style test of conformity than participants who were not excluded. According to Williams *et al.* (2000), participants' conformity was an attempt to ingratiate themselves with other group members. In a related experiment, Lakin, Chartrand and Arkin (2008) found that participants who had been excluded from a similar online ball game subsequently mimicked the mannerisms of a conversation partner to a greater extent than participants who had been included in the ball game. Lakin *et al.* (2008) interpret this as evidence that adults use mimicry as a means by which to affiliate with group members, and so recover their position within the group.

In the current study, we had two main aims. Our first aim was to investigate just how sensitive young children are to ostracism. Recent research has demonstrated that even infants are sensitive to some aspects of group membership, for example they prefer to look at and accept toys from individuals who speak their native language (i.e. ingroup members) over individuals who speak a different language (i.e. outgroup members) (Kinzler, Dupoux & Spelke, 2007). Previous research using survey methods has demonstrated that preschool children can be victims of ostracism (Crick, Casas & Ku, 1999; Crick, Casas & Mosher, 1997), but we do not yet know how sensitive young children are to cues indicating social exclusion. Here we attempt to prime ostracism in 5-year-olds. We do so using an even subtler manipulation than those used in research on adults: for the first time we prime third-party ostracism, and we do so using short videos of moving shapes rather than human actors.

Our second aim was to look for links between ostracism and affiliative imitation in children. The many negative consequences of systematic social exclusion on children's well-being and development have been extensively documented (e.g. Crick, 1996; Crick & Bigbee, 1998; Crick & Grotpeter, 1996; Cullerton-Sen & Crick, 2005; Prinstein, Boergers & Vernberg, 2001). Here we extend previous developmental research by investigating whether children, like adults, possess positive behavioral strategies that they can employ following exposure to social exclusion.

One difficulty in testing the link between imitation and ostracism is that there is little evidence that children under the age of 5 or 6 subconsciously mimic the mannerisms of their interaction partners at all (e.g. see Anderson & Meno, 2003, on contagious yawning). Pilot data for the current study supported this: when engaged in a conversation with an adult experimenter who repeatedly touched her face (as in Chartrand & Bargh, 1999), 5-year-old children did not increase their face touching above baseline levels. Nevertheless, it has been proposed that children's behavior in explicit imitation contexts can reveal a connection between imitation and affiliation (Užgiris, 1981, 1984). For example, Nielsen, Simcock and Jenkins (2008) showed that 24-month-olds copy the actions of a live, socially responsive model more exactly than the actions of a televised (and so non-responsive) model. Presumably, this reproduction of the model's exact actions was an attempt by children to communicate similarity to the model and so affiliate with her (see Carpenter, 2006; Nielsen, 2006). We predicted, therefore, that children who had been primed with ostracism would copy the specific actions a model used to perform a task more closely than children who had not been primed with ostracism. If so, it would suggest an important continuity in function between affiliative imitation in children and nonconscious mimicry in adults.

We thus primed children with a very minimal display of ostracism – two short videos in which one shape was excluded by a group of other shapes – and measured the effects of this prime on children's subsequent imitation of a model's exact behaviors. We chose to test this prediction with 5-year-olds. As 5-year-olds spend considerable time interacting with friends and peer groups, they may have already experienced social exclusion (Crick *et al.*, 1999; Bamer-Barry, 1986) and so have developed behavioral strategies to compensate for its negative effects.

Method

Participants

Participants were 28 children between the ages of 5 and 6 years (*mean* = 5 years, 5 months, *range* = 4 years, 11 months, 29 days–6 years, 0 days). Seventeen of the children were female and 11 male. An additional two children were tested but excluded from the data set; one as a result of equipment failure and one for failure to pay attention during presentation of the videos. All children were native German speakers and were recruited from a number of kindergartens, after their parents had given permission for them to participate in child development studies.

Design and materials

Children were randomly assigned to one of two conditions in a between-subjects design. Depending on the condition, they observed either two videos depicting ostracism or two control videos. After observing the videos, each child participated in an imitation task.

During the experiment, children sat on the floor on a small blue mat placed approximately 80 cm from the experimenter and 25 cm from a laptop computer. The laptop sat on a small chair so that the screen was approximately eye-level for the children. The priming stimuli were created using the 'custom animation' function in PowerPoint and were presented on a Macbook with a 13 inch screen, the resolution of which was 1280 × 800 pixels.

The priming stimuli in each condition consisted of two short videos played consecutively. The scenarios in the videos were inspired by the classic Heider and Simmel (1944) movies which cause both adults and children to attribute social intentions to the movements of geometric shapes (see Abell, Happe & Frith, 2000). Each video depicted four shapes moving around the screen (blue pentagons in the first video, and green, horizontal teardrop shapes in the second video). These shapes did not have facial features, nor did they speak or make any sounds during the videos. Each of the videos was rated by three adult observers (blind to the purpose of the study), all of whom interpreted the ostracism videos, but not the control videos, as depicting social exclusion. The movements made by the shapes during each video were as follows (see also the Appendix).

In the first video in the ostracism condition, three pentagons entered the scene and appeared to play together as a group. After a short delay, a fourth pentagon entered the scene and approached the group. The three pentagons moved away from the fourth shape on four separate occasions in a series of moves which suggested its exclusion from their group. In the final section of the video, the fourth shape gave up its attempts at inclusion, moved away from the group, and came to a halt at the far side of the screen.

In the second video in the ostracism condition, two teardrop shaped objects entered the scene and appeared to play ball together. After a short delay, a third object (with the same shape) entered the scene and tried to join the game. The two shapes refused to pass the ball to the third object, but passed it between themselves a further three times. Subsequent to this, the two shapes abandoned their game and moved away from the third object. The third object then made two more attempts to join the two shapes but was rebuffed both times. As in the first video, the scene ended with the rejected object moving away from the group and coming to a halt at the far side of the screen.

We compared children's behavior in the ostracism condition with their behavior in a baseline control condition in which the videos were very similar to those in the ostracism condition, but did not involve any social exclusion. Critically, the actions made by the group were identical in both conditions. This meant that both the ostracism videos and the control videos contained equivalent information about affiliation, but only the ostracism video contained additional information about social exclusion. In each of the two control videos, the rejected object was replaced by a different type of object, one that was less likely to be seen as being socially excluded. Instead of attempting to be included in the group, this object (a blue, fly-like object in the pentagon videos and a green, butterfly-like object in the ball game videos) made random movements around the screen. This object was approximately the same size and color as the rejected object in the ostracism condition and the number of movements it made was matched to the
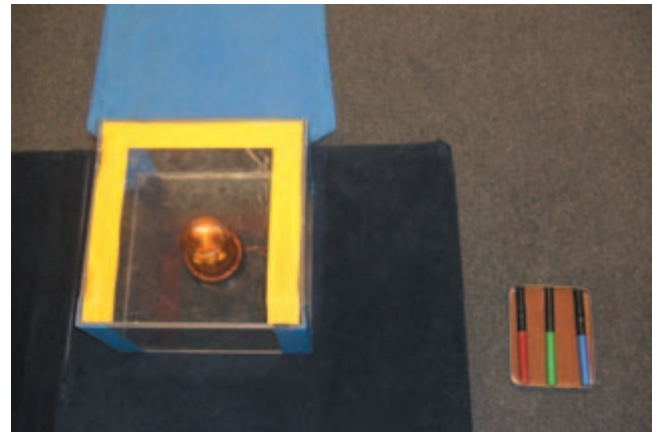

Figure 1 *The light box on which the imitation task was performed and, to the right, the three wooden tools provided for the task.*

movements made by the rejected object. Social contingency was also held constant across conditions: every time the group moved, this object moved as well.[1]

In addition to these videos, a final 30-second video depicting seven shapes playing together was shown to each child at the end of the test session (subsequent to the imitation task). This video did not form part of the manipulation; its sole purpose was to alleviate any negative feelings which may have been induced by the ostracism videos (and to model inclusive behavior to children).

The box on which the imitation task was performed was made from clear Perspex and was 20 cm × 30 cm × 30 cm in size. When the top of the box was pressed, an orange light inside the box lit up and spun around (see Figure 1). In addition to the box, three wooden tools – cylindrical sticks – were provided for the imitation task. Each of these tools was 15 cm in length. One half of each of these tools was colored (blue, green or red) and the other half was black.

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[1] It was surprisingly difficult to come up with a control condition that adult observers did not see as suggesting ostracism while, at the same time, retaining the basic features of the videos from the ostracism condition. In our first attempt we kept the group's movements constant and made the individual shape simply follow a different, random path instead of repeatedly approaching the group. However, adult observers still interpreted the videos in terms of social exclusion. In our second attempt, we changed the identity of the individual shape to something that might be seen as moving around with no social relationship to the group: a butterfly or fly. We attempted to match the movement of this new shape to that of the rejected shape in the ostracism condition but, again, adult observers described the scenarios in terms of social exclusion. The sensitivity of our adult raters to even the slightest cues suggesting social exclusion meant that it was necessary to manipulate both the identity of the relevant shape and the movements it made around the screen. An alternative possibility might have been to delete the rejected shape from the control video completely, leaving only the actions of the group. However, this would have been a relatively weak control as both the total number of movements and the number of socially contingent movements made by the shapes would have varied across conditions.

Procedure

Testing was conducted by an experimenter (E) who was blind to the hypothesis of the study, the content of the videos, and the condition to which each child had been assigned. The experimenter invited children individually into a quiet room in their kindergarten and asked them to sit opposite her on a small mat. After an initial warm-up phase which involved drawing pictures and answering questions (identical in both conditions), E told children she needed to read something, but that they could watch a video while she did. Throughout the test session the laptop screen was orientated away from E so that she could not see the content of the videos. It was therefore necessary for a second experimenter to activate the videos. This second experimenter, sitting unobtrusively in the corner of the room, surreptitiously activated the video via remote control. The two videos were played consecutively, always in the same order: first the pentagons, followed by the ball game. The ball game video started automatically, as soon as the pentagons video was complete. After the videos were finished, as indicated by a soft click, E put down her magazine, brought out the light box, and said to children, 'Oh, your video has ended, then I'll show you my new toy', after which she proceeded to act on the box. The demonstration consisted of eight components: first E chose the green tool from among the set of three colored tools (1). After choosing this tool, she rolled it between her hands several times (2). She then rotated the tool in her hands such that the black end was facing towards the floor (3), and grasped it in her right fist (4). Subsequent to this, she held the tool vertically (5) and dragged it (6) three times (7) along the lid of the box, always in the same direction (8): making a line from the corner of the box closest to the child to the corner of the box closest to her own body, each time turning on the light. E always looked at the child at the start of the demonstration, but when she was acting on the box she looked only at the apparatus. After the demonstration was complete, E looked up at the child, pushed the box and the three tools towards the child, and said, 'Now you'. The response phase lasted until the child had finished acting on the box. After the response phase was complete, E asked the child to watch the final video in which seven shapes played together.

Coding

Children's responses were coded from videotape by the first author, who was blind to the condition to which each child had been allocated. Each child was given a score between 0 and 8 depending on how many components of the demonstration they reproduced (see Table 1 for scoring procedures). Data from six children (21% of the data set) were independently coded in order to assess inter-rater reliability. The second coder was blind to the hypothesis of the study, the content of the videos, and the condition to which each child had been
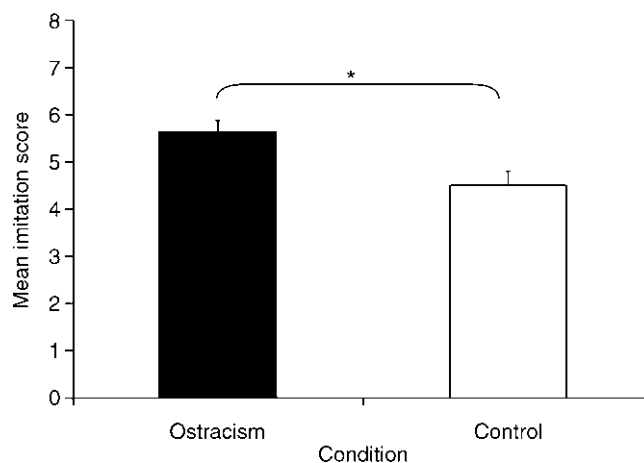

Figure 2   *The mean number of components from the demonstration that children reproduced in the ostracism and control conditions. Error bars represent + 1* SE, * *indicates a statistically significant difference,* p = .006.

assigned. Agreement between the two coders was 100%, Cohen's Kappa = 1.

Results

Initial inspection of the data revealed that there was no main effect of gender ($F(1, 24) = 2.56$, $p = .12$), and, more importantly, no condition × gender interaction ($F(1, 24) = 0.73$, $p = .40$). Consequently, the data were collapsed across gender for further analyses.

Figure 2 indicates the mean imitation score of children in the ostracism and control conditions. As predicted, children in the ostracism condition reproduced significantly more components of the demonstration than children in the control condition ($t(26) = 3.02$, two-tailed $p = .006$, $rY\lambda = .51$, a medium effect). An inspection of the individual components revealed that this effect was not driven by a tendency to reproduce any particular element from the demonstration (see Table 1).

It is important to note that almost all children – 13 out of 14 in the ostracism condition, and 12 out of 14 in the control condition – succeeded in turning on the light at least once, and there was no difference in this measure between conditions ($\chi^2 = .37$, $p = .54$). The remaining three children all showed a clear attempt to turn on the light. Thus, children in both conditions were equally motivated to act on the light box and interested in the imitation task, but children in the ostracism condition copied E's specific actions more closely than children in the control condition.

Discussion

The present study investigated whether children increase their affiliative behavior following indirect exposure to

Table 1 *Description of each component of the demonstration and the percentage of children in each condition who reproduced it*

Component of action	Description of model's behavior	Operational criteria for a correct response	Percentage of children who reproduced the action component	
			Ostracism condition	Control condition
1. Tool choice	E chooses the green tool.	The first tool S uses to operate the box is green.	28.6	28.6
2. Roll tool	E rolls the tool between her hands before using it to operate the box.	S rolls the tool between his/her hands at any point during the response phase.	78.6	50.0
3. Tool orientation	E rotates the tool to use the black part to contact the box.	S uses the black part of the tool to contact the box at any point during the response phase.	92.9	71.4
4. Tool grip	E holds the tool in her fist.	S contacts the box while grasping the tool in his/her fist at any point during the response phase.	92.9	78.6
5. Tool angle	E holds the tool perpendicular to the box.	S holds the tool at an angle which is within 10° of vertical while contacting the box at any point during the response period.	100	100
6. Drag tool	E drags the tool along the box such that the tool moves approximately 10 cm across the lid.	S drags the tool more than 3 cm along the lid at any point during the response phase.	92.9	78.6
7. Number of touches	E uses the tool to activate the box a total of 3 times.	S makes exactly 3 attempts to activate the light inside the box.	35.7	21.4
8. Line of touches	E's three actions make a line along the box such that her first action is closest to S and her last action is closest to herself.	S's actions on the box form a line either travelling from himself/herself to E or vice versa.	28.6	21.4

social exclusion. Results showed that children primed with ostracism imitated the actions of a model significantly more closely than children not primed with ostracism. Interestingly, however, children in the two conditions did not differ in their tendency to turn on the light – every child did, or attempted to do this. In other words, whereas children in the two conditions seemed equally motivated to perform the instrumental component of the task, children primed with ostracism reproduced the model's specific actions more closely than children not primed with ostracism. We can thus conclude that from relatively early in development the need to belong exerts a powerful influence on children's social behavior, leading them to increase their imitation in response to surprisingly subtle cues indicating exclusion from the group.

These results represent the first demonstration that it is possible to prime ostracism in children. Perhaps especially striking is the fact that the prime was composed of a scene in which a third party was ostracized. This is in contrast to paradigms used with adults in which participants have always experienced ostracism directly; for example, by exclusion from a ball game, or an online chat (e.g. Lakin *et al.*, 2008; Williams *et al.*, 2000; Williams & Sommer, 1997). Moreover, the children in our experiment did not even experience human actors being ostracized, with all of the emotional and other cues that might be present in such a display. Instead, they were primed with short videos in which a small shape appeared to be excluded from a group of other shapes. These shapes did not have facial features, nor did they talk, or make any sounds throughout the videos. Humans, it seems, are so sensitive to the possibility of social exclusion that the mere hint that an object is being excluded from a group (even if that object is only a moving shape) is sufficient to impact upon their social behavior.

An unanswered question remains, however: through what means did the ostracism prime lead to increased imitation? One possibility is that the children who received the ostracism prime used imitation strategically in order to ingratiate themselves with another group member (see Lakin *et al.*, 2008). According to this interpretation, the ostracism prime induced a goal to affiliate, which in turn led children to imitate the actions of the model more closely, presumably in an attempt to communicate their similarity to her (Užgiris, 1981, 1984). A second possibility is that the ostracism prime altered the way in which children processed incoming social information, and so affected their imitation. Previous research has demonstrated that the experience of ostracism enhances recall of social information. For example, Gardner, Pickett and Brewer (2000) found that, after being excluded from an online chat, adult participants recalled significantly more social information from a series of diary entries than participants who had been included in the chat. Gardner *et al.* (2000) interpreted this result as evidence that an experience of social exclusion creates a sort 'social hunger' which leads people to increase their attention to, and recall of, social information. In the context of our experiment, it is possible that children who observed the ostracism prime noticed and/or recalled more aspects of the demonstration than children given the neutral prime, and this led them to reproduce the model's actions more precisely. These two interpretations are not mutually exclusive and, in theory, could even operate in parallel, but further research would be needed to determine the relative influence of the two factors.

The present research has important implications for our understanding of social imitation. We have attempted to draw parallels between children's tendency to copy the exact means used by a model and adults' tendency to subconsciously mimic the behavior of their interaction partners. Previous theory and research has suggested that both forms of copying behavior are related to affiliation (Carpenter, 2006; Lakin & Chartrand, 2003; Nielsen, 2006; Užgiris, 1981), but here we go beyond that and show (together with Lakin *et al.*, 2008) that both forms of copying behavior vary according to the same social factor: ostracism. Thus we provide strong support for the claim that imitation performs a social function in childhood. In doing so, we provide an important bridge between social psychological research on mimicry and developmental research on imitation. It would be interesting for future research to investigate more fully the similarities and differences between both forms of copying behavior, as well as their developmental origins and trajectories.

This paper represents a new departure in developmental research on ostracism. Previous research has, understandably, used predominantly non-experimental methods such as teacher and self report to explore children's understanding and experience of ostracism (e.g. Crick *et al.*, 1999; Crick, Ostrov, Burr, Cullerton-Sen, Jansen-Yey & Ralston, 2006; Cullerton-Sen & Crick, 2005; Ostrov, 2008; although see Nesdale & Lambert, 2007, for an alternative experimental approach using pretense with older children). The third-party priming method developed in this paper offers a novel, non-verbal means through which social exclusion and other related phenomena can start to be studied experimentally in young children.

In summary, this study, along with related research, contributes important information to our understanding of the basic human need to belong. Even as young children, we prefer members of our ingroup (Kinzler *et al.*, 2007), feel the need to conform to majority opinions (Walker & Andrade, 1996), increase our prosocial behavior in response to the mere hint of the group (Over & Carpenter, 2008) and, as we have seen here, respond actively with affiliative behaviors when our membership in the group is threatened. Thus, even from early in development, the pull of the group exerts a powerful influence over our behavior.

Appendix

Ostracism Condition

0–13 secs: Two shapes enter and play ball together. They pass the ball to each other three times.

14 secs: A third shape enters and tries to join them.

15–29 secs: The two shapes pass the ball to each other three more times, but refuse to pass it to the third shape.

29 secs: The two shapes abandon their game and move away from the rejected shape.

30–40 secs: The rejected shape makes three attempts to join them, but each time they ignore it and move away.

42–45 secs: The rejected shape gives up and moves away from the other two shapes.

Control Condition

0–13 secs: Two shapes enter and play ball together. They pass the ball to each other three times.

14 secs: A butterfly enters the scene.

15–29 secs: The two shapes pass the ball to each other three more times, paying no attention to the butterfly.

29 secs: The two shapes abandon their game and move across the screen.

30–40 secs: The butterfly moves across the screen three times. Each time the butterfly moves, the shapes move.

42–45 secs: The butterfly moves to the bottom left hand side of the screen, and stops in the same location as the rejected shape in the ostracism condition.

Acknowledgements

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