

In-Group Ostracism Increases High-Fidelity Imitation in Early Childhood

Psychological Science
2016, Vol. 27(1) 34–42
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DOI: 10.1177/0956797615607205
pss.sagepub.com


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Abstract

The Cyberball paradigm was used to examine the hypothesis that children use high-fidelity imitation as a reinclusion behavior in response to being ostracized by in-group members. Children ($N = 176$; 5- to 6-year-olds) were either included or excluded by in- or out-group members and then shown a video of an in-group or an out-group member enacting a social convention. Participants who were excluded by their in-group engaged in higher-fidelity imitation than those who were included by their in-group. Children who were included by an out-group and those who were excluded by an out-group showed no difference in imitative fidelity. Children ostracized by in-group members also displayed increased anxiety relative to children ostracized by out-group members. The data are consistent with the proposal that high-fidelity imitation functions as reinclusion behavior in the context of in-group ostracism.

Keywords

affiliation, cultural learning, imitation, ostracism, ritual, social convention, social groups, Cyberball

Received 4/16/14; Revision accepted 8/28/15

Humans have a variety of psychological adaptations for group living (Kurzban & Neuberg, 2005). Infants (Buttelmann, Zmyj, Daum, & Carpenter, 2013; Powell & Spelke, 2013) and preschool children (Rhodes, 2012) are highly sensitive to social categories. Children as young as 4 years old prefer in-group members, according to data from both the Implicit Association Task (Dunham, Baron, & Carey, 2011) and stated preferences for in-group members (Abrams, Rutland, & Cameron, 2003; Nesdale & Flessler, 2001). There is also evidence that preschool children expect other people to conform to group behavior (Killen & Rutland, 2011) and imitate group conventions with high fidelity (Clegg & Legare, in press; Legare, Wen, Herrmann, & Whitehouse, 2015).

New research has demonstrated that the experience of participating in a ritual (i.e., group-specific, conventional behavior) increases in-group affiliation in children to a greater degree than does group membership alone (Wen, Herrmann, & Legare, 2015). These results support the proposal that rituals facilitate in-group cohesion (Henrich, 2009; Legare & Watson-Jones, 2015; Whitehouse & Lanman, 2014). We propose that young children are motivated to engage in social conventions as a means of

affiliation with other group members (Legare & Nielsen, 2015).

The adaptive benefits of group membership may have provided humans with an evolutionarily prepared ostracism-detection system that directs cognitive resources toward coping with the threat of being ostracized (Buss, 1990; Kerr & Levine, 2008). In addition to detecting the threat of ostracism, individuals must engage in an appropriate behavioral response to being ostracized. Rejection by an individual is distinct from being ostracized by a group and results in different responses, such as withdrawal (Williams, 2007). Previous research with adults has demonstrated that the first response to being ostracized is attempts at reinclusion (Bozin & Yoder, 2008; Carter-Sowell, Chen, & Williams, 2008). For example, when ostracized by in-group members, people increase behavioral mimicry (i.e., nonconsciously imitating the actions of an interaction partner) as a means of

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increasing liking and rapport (Lakin, Chartrand, & Arkin, 2008). Imitation may be particularly important in facilitating group inclusion; imitation increases rapport between interaction partners (Chartrand & Lakin, 2013).

Like adults, young children may use imitation as a behavioral strategy to reaffiliate with in-group members after being ostracized. For example, priming third-party ostracism increases young children's imitative fidelity of an instrumental task (Over & Carpenter, 2009) as well as actions marked as social-group conventions (Watson-Jones, Legare, Whitehouse, & Clegg, 2014). Imitation may be particularly important in facilitating group inclusion, given that it increases rapport between interaction partners (Chartrand & Lakin, 2013). In recent work with young children, high-fidelity imitation has been linked to social motivations, such as affiliation (Over & Carpenter, 2012) and acquiring social conventions (Herrmann, Legare, Harris, & Whitehouse, 2013; Legare et al., 2015). In addition, infants are more likely to imitate members of an in-group than members of an out-group (Buttelmann et al., 2013).

Our objective was to examine how a first-hand experience of being ostracized or included by in-group or out-group members affects the fidelity of young children's imitation of a social-group convention. We hypothesized that young children will preferentially imitate in-group rather than out-group members. After being ostracized by in-group members, young children may use high-fidelity imitation as a reinclusion behavior. We also examined whether children's emotional responses to ostracism mediate their behavioral responses to ostracism. Given previous research demonstrating the negative impact of ostracism on well-being, we expected that children would have a negative affective response to being ostracized.

Our study is thus a unique synthesis of previous research aimed at examining the early-emerging motivation to engage in high-fidelity imitation of group-specific conventions as a means of promoting affiliation. This study is also the first to examine children's affective response to ostracism and whether young children's imitative fidelity of a group convention (a behavioral measure) is higher after they are ostracized rather than included by in-group members and whether this effect is smaller when children are interacting with out-group members. We chose a conventional action sequence (i.e., arbitrary actions that contained no clear end-goal; Legare et al., 2015) because children interpret such sequences as group-specific behaviors (Diesendruck & Markson, 2011) and use group conventions to evaluate ostracism (Killen, 2007). Using a novel social convention allows children to demonstrate conformity via high-fidelity imitation. Thus, the current study moves beyond research on how children use social-conventional reasoning to judge

inter- and intragroup relations (Killen & Rutland, 2011) by examining how they use performance of social conventions as reinclusion behavior.

To examine the experience of being ostracized or included in the context of in-groups or out-groups, we used a novel group paradigm in which we manipulated group membership (Dunham et al., 2011; Tajfel, 1970). Next, Cyberball, a virtual ball-tossing game, was used to manipulate whether the children experienced being ostracized or included (Williams, Yeager, Cheung, & Choi, 2012). We selected inclusion as a comparison condition because of its common usage as a control in ostracism research (Williams, 2007). Each child was either included or excluded by in-group members or out-group members. Children who played with in-group members had an opportunity to imitate an in-group member, and those who they played with out-group members had an opportunity to imitate an out-group member.

We predicted that (a) children in the ostracism conditions would engage in higher imitative fidelity than children in the inclusion conditions, (b) children would imitate an in-group member with higher fidelity than they would imitate an out-group member, (c) children who were excluded by their in-group would engage in higher-fidelity imitation than those included by their in-group, and (d) inclusion or exclusion by an out-group would not affect imitative fidelity of an out-group convention. We also predicted that children ostracized by their in-group would display more negative affective responses (in particular, higher levels of anxiety and frustration) than children ostracized by out-group members.

Method

Participants

A total of 176 young children (mean age = 5.92 years, age range = 5.0–6.11; 96 girls, 80 boys) were recruited from a university town in the American southwest. Participants were primarily White and from middle-class families. Eleven participants were excluded as a result of experimenter error, parental interference, or their choice to terminate the session. A power analysis indicated that a sample size of 176 participants was required for the study to have a medium expected effect size ($\eta_p^2 = .060$).

Design

We used a 2 × 2 between-subjects design to create four conditions (in-group ostracism, in-group inclusion, out-group ostracism, and out-group inclusion). A novel group paradigm (Dunham et al., 2011; Tajfel, 1970) was used to assign in-group status to the yellow group and out-group status to the green group. Cyberball was used as an

experimental paradigm to manipulate whether the children had a first-person experience of being ostracized or included (Williams et al., 2012).

Materials and procedure

All parents signed a consent form, and all children provided oral assent to participate in the study. Each child sat down with the experimenter, who said:

In a minute you are going to be playing a computer game with three other people who are in other rooms. There are two groups of people who are playing in the game—the yellow group and the green group. You are part of the yellow group!

All participants were assigned to the yellow group and given a yellow visor and two yellow wristbands to signify their group membership. Next, participants took part in a training task that primed their similarity to other members of the yellow group. After the training task, participants played the Cyberball game, in which they were either included or ostracized by members of the yellow or green group. After the game, participants were shown a video demonstration of an in-group member or out-group member engaging in a novel social-group convention. The children were then presented with the object set they saw used in the video in an imitation task.

Yellow-group-preferences training task. After being assigned to the yellow group, participants engaged in the yellow-group-preferences training task. As a means of increasing a sense of shared experience and preference, this task was designed to show that individuals within the yellow group and the participant have similar preferences. The children were shown a PowerPoint presentation on a computer. The presentation began with a child's drawing of two children, each of whom was wearing yellow and holding a yellow balloon. When the children clicked on the drawing (using a computer mouse), they viewed the next slide, which presented pictures of a dog, a cat, and a horse. Participants were asked to click on the animal that was their favorite. The next slide showed a picture of whichever animal they chose next to the drawing from the first slide. The children were told that "people in the yellow group like that kind of animal too." This same process was repeated for fruit preferences (i.e., an apple, a pear, and a strawberry), and playground-equipment preferences (i.e., monkey bars, swings, and a slide).

Cyberball. After the training task, to prime ostracism versus inclusion, we had participants play Cyberball (Williams et al., 2012). The Cyberball game involves tossing a ball back and forth with three other individuals

who were either in-group or out-group members (Fig. 1). Participants were told, "Okay, now you are going to play the computer game I told you about. You are going to be playing with kids that are in other rooms." Participants in the in-group conditions were told that the children in the other rooms were also part of the yellow group. Participants in the out-group condition were told that the children in the other rooms were part of the other group (i.e., the green group). Next, participants were told the following:

This game is a ball tossing game. So, to pass the ball to another player you just move the arrow to the player you want to pass the ball to and click the button. You can choose to pass the ball to whichever player you want and the other players choose whom they are going to pass the ball to as well. While you are playing the game I want you to imagine that you are on the playground actually passing the ball back and forth with the other players in the game. Okay?

Ostracism condition. When the game began, the participant's avatar, at the bottom center of the screen, wore a yellow T-shirt. The three other players, shown at the upper left, right, and top of the screen, wore either yellow T-shirts (i.e., the participant was playing with in-group members) or green T-shirts (i.e., the participant was playing with out-group members; Wirth & Williams, 2009). The player on the upper left held the ball and tossed it to either the participant or to one of the other players. Participants received three ball tosses and then were left out of the game for the remaining 2 min of game play. The ball was thrown a total of 30 times, so participants in this condition witnessed the ball being passed 27 times.

Inclusion condition. The inclusion condition was very similar to the ostracism condition, except that participants were tossed the ball periodically throughout the game. The ball was also thrown a total of 30 times within the inclusion condition, and participants received the ball seven to eight times during the game.

Affective-response coding. To assess affective responses to the experience of being ostracized by an in-group as opposed to an out-group, a research assistant who was unaware of the hypothesis coded the children's facial, postural, and verbal displays (in a manner similar to that described by Coan & Gottman, 2007). The children were video-recorded while they played the Cyberball game (duration of 2–3 min). The children's behavior on this video were coded for displays of anxiety (e.g., slumping posture, raised inner eyebrows, frowns, sighs, and

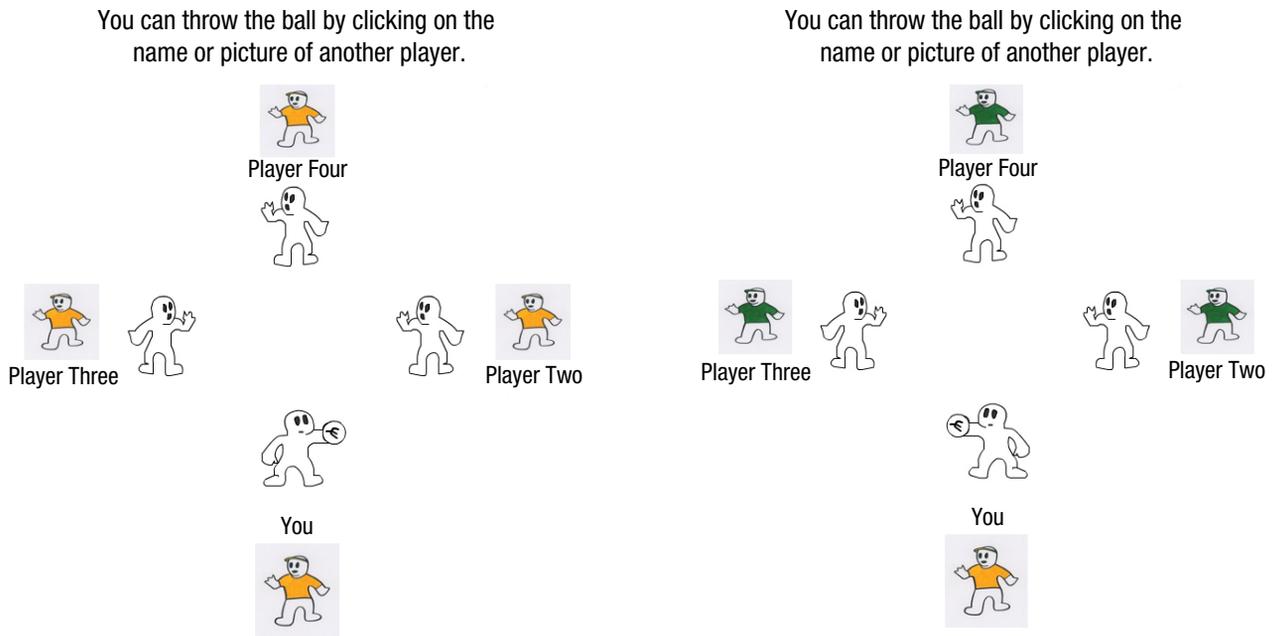


Fig. 1. Examples of Cyberball screens. The left screenshot shows an example of a screen that might be seen in the in-group condition; all of the players are wearing yellow T-shirts. The right screenshot shows an example of a screen that might be seen in the out-group condition; three of the players are wearing green T-shirts, and the participant's avatar wears a yellow T-shirt. At each position, one avatar wears the appropriate shirt color and the other avatar passes the ball, but together they represent one player.

verbal statements about being upset that they were being left out) and frustration (e.g., a furrowed brow, pursed lips, and verbal statements indicating frustration at being left out) in 15-s intervals while they were playing the Cyberball game (making a total of 7–11 15-s intervals). Children who displayed any sign of anxiety during each interval received a 1; those who did not received a 0. Frustration was scored in the same way. It was possible for children to be double coded (i.e., the same child could show displays of frustration as well as anxiety). To create proportions of displays of anxiety, we summed the occurrence of anxiety in each 15-s interval across participants and divided by the total number of intervals in which they played the game (7–11 intervals total). We did the same for frustration.

Video demonstration of a novel social-group convention. After the Cyberball game, participants were shown a video demonstration of an adult engaging in a novel social-group convention. In the in-group condition, the model was wearing a yellow shirt, visor, and wristbands. In the out-group condition, the same model was wearing a green shirt, visor, and wristbands. Each video was 20 s long. The stimuli included a blue cube, an orange sphere, a purple object that resembled a chess piece, and a wooden pegboard with three wooden pegs, each of a different color (i.e., yellow, red, and green).

The demonstration consisted of three body-oriented elements: a postural element, a gestural element that could be interpreted as intentional or idiosyncratic, and an element in which an object was placed on the body. The demonstration also had three object-oriented movements: tapping an object twice on a peg, pairing two separate objects on two separate pegs, and using objects in a particular sequence.

Before playing the video, conventional language was used to reinforce the idea that the action sequence was a social-group convention. Participants in the in-group conditions were told, "This is how the yellow group always does it"; those in the out-group conditions were told, "This is how the green group always does it." The video began with the demonstrator sitting behind a table with her hands placed flat on the table. A tray of objects was on the table in front of her (i.e., the wooden pegboard, the blue cube, the orange sphere, and the purple piece). The demonstrator lifted her left fist and placed her chin on it. She then lifted her right hand and moved her index finger across her right eyebrow in a sweeping motion from left to right from the demonstrator's point of view. She then immediately picked up the blue cube and pressed it on her forehead. She moved the cube over the green peg on the pegboard, tapped on the green peg twice, and then placed the blue cube back on the tray. The demonstrator then swept her finger across her eyebrow as before. She

then picked up the orange sphere and performed the same actions as with the blue cube, except that she tapped twice on the red peg, not the green peg. After placing the sphere back on the tray, she swept her finger across her eyebrow again and then returned her hands to their original position flat on the table (Fig. 2).

Imitation task. At the conclusion of the demonstration video, the screen was turned off, and the objects that the child had seen in the video were placed in view, arranged in the same configuration from the child's perspective when viewing the video. The experimenter told the child, "See these objects here? Now it's your turn." The objects were then placed within reach, and the participant was told, "Here you go." The child was given 120 s to interact with the objects before the objects were moved out of reach but within view.

One research assistant who was unaware of the conditions and hypothesis completed 100% of the coding, which was compared to coding completed by the first author. Imitative behavior was coded for the following elements of the action sequence: (a) blue cube on green peg, (b) orange sphere on red peg, (c) engaging in double-tapping action, (d) engaging in the correct sequencing (i.e., using the blue cube first, then the orange sphere), (e) reproduction of the modeled forehead swiping, and (f) pressing an object to the forehead. For each target behavior that a child produced, he or she was given 1 point; thus the minimum imitative-fidelity score was 0, and the maximum score was 6. Because only 1 participant reproduced the modeled postural element of placing a fist underneath the chin, this element was not included in the summary score.

Debriefing. At the conclusion of the experiment, all participants in the ostracism conditions were told that they were not actually playing a game with other children and that the computer was programmed to pass the ball to the other players and not to them. They were then offered a chance to play the game again and have the ball passed to them more often. All participants were asked if they had any questions about the game or the experiment in general.

Interrater reliability

A separate coder, unaware of the conditions and hypothesis, recoded all of the imitative fidelity data. Interrater reliability was high for the imitative-fidelity summary score, Cohen's $\kappa = .85$. Any coding discrepancies were resolved through discussion to reach 100% agreement. For the affective-response coding, a separate coder, also unaware of the conditions and hypothesis, recoded the data from 22 children (~25% of the total sample, drawn

from the in-group ostracism condition and the out-group ostracism condition, $n = 88$). Intraclass correlation coefficients (ICCs) were calculated, and interrater agreement (Coan & Gottman, 2007) was found to be excellent for the coding of both frustration, $ICC(2,21) = .96, p = .0001$, and anxiety, $ICC(2,21) = .90, p = .0001$.

Results

Imitative fidelity

We performed a 2×2 analysis of variance with social-exclusion condition (ostracism or inclusion) and group membership (other players belonged to the in-group or out-group) as between-subjects variables and imitative-fidelity score (0–6) as the dependent measure. The results revealed a main effect of social-exclusion condition, $F(1, 172) = 6.07, p = .015, \eta_p^2 = .034$. Planned comparisons with Bonferroni correction revealed that the children in the ostracism conditions ($M = 3.38, SD = 1.01$) had higher imitative-fidelity scores than the children in the inclusion conditions ($M = 2.84, SD = 1.01$), $p = .034$, mean difference = 0.534, 95% confidence interval, or CI = [0.106, 0.962]. There was no main effect of group membership, $F(1, 172) = .223, p = .638$. The children who played Cyberball with members of the in-group did not have higher imitative-fidelity scores ($M = 3.16, SD = 1.01$) than those who played with members of the out-group ($M = 3.06, SD = 1.01$). There was also no interaction between social-exclusion condition and group membership, $F(1, 172) = 1.21, p = .272$ (Fig. 3).

To examine the impact of ostracism and group membership on imitative fidelity, we conducted planned Bonferroni-corrected comparisons. Tests of the simple effects of social-exclusion condition revealed that among the children who played the game with in-group members, those in the ostracism condition ($M = 3.55, SD = 1.27$) had higher imitative-fidelity scores than those in the inclusion condition ($M = 2.77, SD = 1.49$), $F(1, 172) = 6.36, p = .013, \eta_p^2 = .036$, mean difference = 0.773, 95% CI = [0.168, 1.38]. Among children who played the game with out-group members, imitative-fidelity did not differ significantly between the ostracism condition ($M = 3.20, SD = 1.44$) and the inclusion condition ($M = 2.91, SD = 1.54$), $F(1, 172) = .929, p = .336$. Tests of the simple effects of group membership revealed that imitative-fidelity scores did not differ between ostracized children who played the game with in-group members and those who played the game with out-group members, $F(1, 172) = 1.24, p = .268$. Finally, the imitative-fidelity scores of the children in the inclusion condition did not differ between those who played with in-group members and those who played with out-group members, $F(1, 172) = .198, p = .657$.

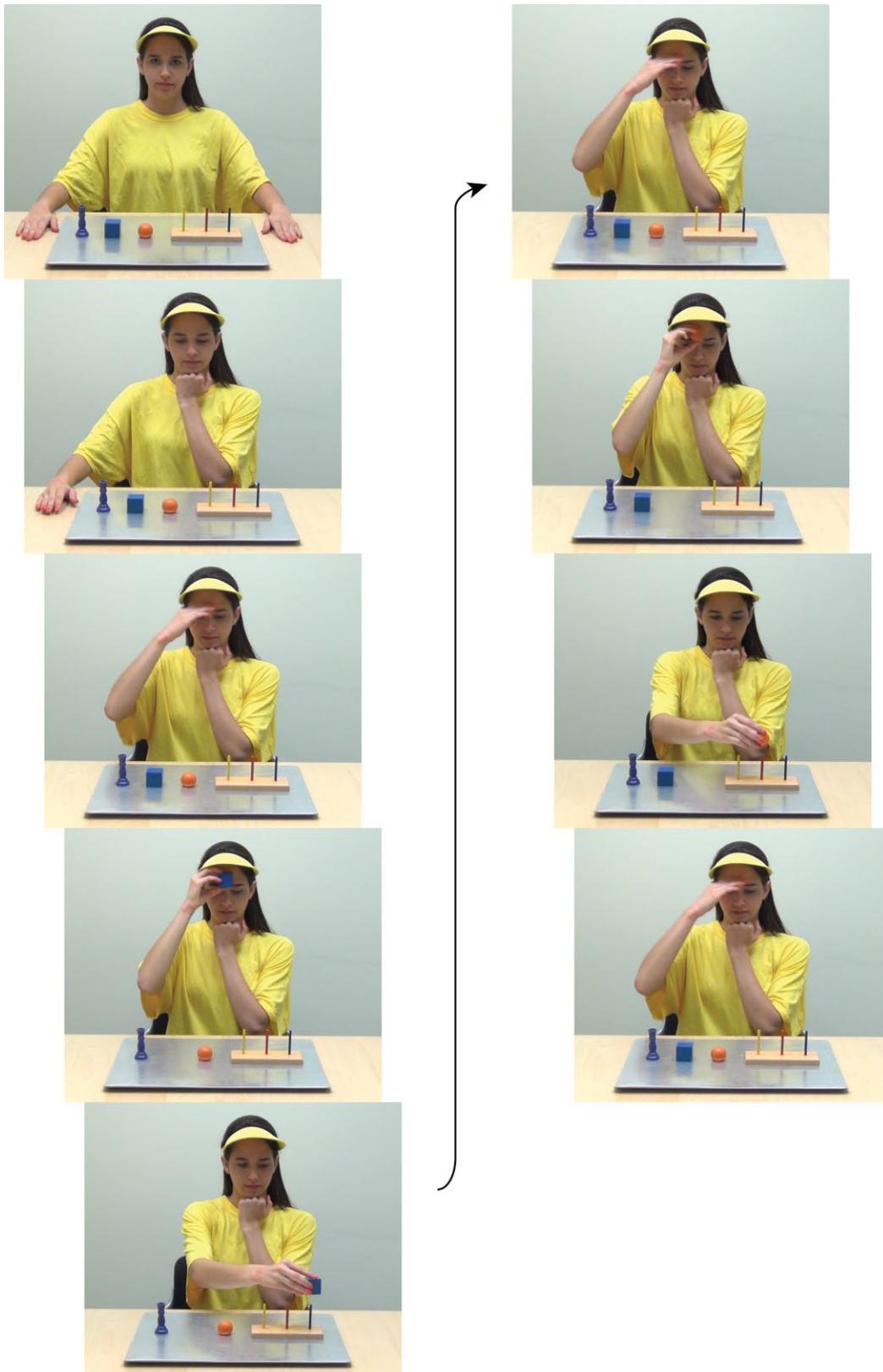


Fig. 2. Screenshots from the video demonstration. The model performed several actions involving touching her face and moving blocks (see text for details). In the in-group condition (illustrated here), the model was wearing all yellow. In the out-group condition, the model was wearing all green.

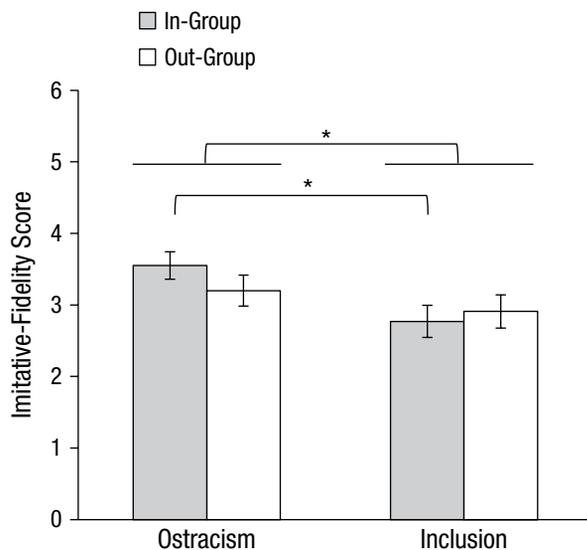


Fig. 3. Mean imitative-fidelity scores of the children in the ostracism and inclusion conditions, separately for those who played with in-group and out-group members. Error bars represent 95% confidence intervals.

Affective response

To examine affective response within the ostracism conditions (in-group-ostracism and out-group-ostracism), we scored the anxiety and frustration displayed by each child during the Cyberball game. First, the number of 15-s time periods during which the child displayed each emotion was tallied. We then divided these numbers by the total number of 15-s time periods during which the child was engaged in the game. Anxiety scores were significantly higher in the in-group-ostracism condition ($M = 0.21$, $SD = 0.21$) than in the out-group-ostracism condition ($M = 0.12$, $SD = 0.18$), $t(86) = 2.05$, $p = .043$, $d = 0.46$, mean difference = 0.09, 95% CI = [0.003, 0.167]. However, frustration scores did not differ between the in-group-ostracism condition ($M = 0.14$, $SD = 0.18$) and the out-group-ostracism condition ($M = 0.11$, $SD = 0.18$), $t(86) = 0.969$, $p = .335$.

To examine whether anxiety or frustration was related to imitative fidelity, we calculated Pearson correlation coefficients. Neither anxiety, $r = .179$, $n = 88$, $p = .245$, nor frustration, $r = -.043$, $n = 88$, $p = .783$, was correlated with the imitative-fidelity summary scores. To explore the possibility that anxiety mediated imitative fidelity differentially by condition, we conducted a Sobel mediation test; the results indicated that anxiety was not a mediator of imitative fidelity, $z' = 0.314$, $p = .753$.

Discussion

This study provides evidence that young children are sensitive to being ostracized and respond similarly to

adults on behavioral measures of affiliation. Children ostracized by in-group members imitated an in-group convention with higher fidelity than children included by in-group members. In contrast, children ostracized or included by out-group members did not differ in their imitative fidelity of an out-group convention. These results are consistent with previous developmental research documenting young children's in-group biases (Nesdale & Flessner, 2001; Nesdale et al., 2007) and stated expectations for conformity to in-group behaviors (Abrams et al., 2003; Killen & Rutland, 2011; Watson-Jones et al., 2014). Our data are consistent with the proposal that children may be motivated to engage in social-group conventions to affiliate with in-group members (Legare & Nielsen, 2015).

Our results are also consistent with evidence demonstrating the powerful psychological effects of being ostracized—it increases imitative fidelity, regardless of group membership. This study used a novel behavioral measure, imitative fidelity, and is thus the first to examine the effects of ostracism on a behavioral response in early childhood. To our knowledge, this experiment is the first to use Cyberball with young children (5- to 6-year-olds), and it has demonstrated the potential viability of Cyberball as a manipulation of social exclusion in early childhood. Thus, this research demonstrates that the behavioral response to being ostracized observed in adults emerges early in development, lending support to the hypothesis that a system for detecting and responding to being ostracized is evolutionarily prepared.

Our data did not provide evidence of an independent effect of group membership on imitative fidelity. This was unexpected given previous research on in- and out-group preferences and attitudes (Dunham et al., 2011) and infants' preferential imitation of in-group members (Buttelmann et al., 2013). One potential explanation is that the novel group paradigm may not influence behavior in the same way that it influences self-reported preferences and attitudes. Future research should examine the conditions under which varying strengths of group membership affect behavioral responses. Research should also examine how being ostracized by in-group or out-group members affects imitation of an out-group social convention. Research of this kind would provide information about the extent to which children affiliate with a new group after being ostracized by their in-group.

The children who were ostracized by in-group members displayed significantly more anxiety than those ostracized by out-group members. In-group and out-group ostracism did not, however, differ in their effect on displays of frustration. In the ostracism conditions, the children's participation in the game was thwarted, and therefore they experienced similar levels of frustration whether they were ostracized by in-group or out-group

members. Thus, being ostracized has the unique effect of inciting anxiety specifically in the context of in-group membership. Anxiety may focus attention to social information (Gardner, Pickett, & Brewer, 2000), such as social conventions performed by group members. Anxiety did not mediate the children's imitative fidelity. Thus, even though the children had a more negative emotional response to the experience of being ostracized by in-group members than to the experience of being ostracized by out-group members, it did not influence their behavioral response. Future research should examine what mediates behavioral responses after an experience of being ostracized.

Future research should also examine additional factors that may moderate children's imitative fidelity in the context of in-group ostracism. Our data indicate that children's imitation of a group convention (a morally neutral behavior) increased after being ostracized. Would children be equally likely to imitate a negative (morally proscribed) behavior when under the threat of being ostracized by an in-group? Prior research has found that when individuals are motivated to present a positive self-image they are less likely to engage in mimicry of negative affective displays (Estow, Jamieson, & Yates, 2007). Other research on costly signaling within social groups indicates that individuals engage in rituals that are potentially costly to the self to demonstrate their commitment to the group (Sosis & Alcorta, 2003). These behaviors act as honest signals to other group members that individuals can be trusted and are valuable group members. We predict that, if children feel threatened with being ostracized by in-group members and then witness in-group members engaging in objectively negative behaviors, they would imitate those behaviors if they were interpreted as a means of reinclusion in the group.

In reciprocal interaction, adherence to social conventions fosters trust and affiliation that is essential to maintaining group membership and cohesion (McElreath, Boyd, & Richerson, 2003). Our findings demonstrate that children may use imitation of a social convention as a reinclusion strategy and that they are sensitive to being ostracized in the context of in-group membership. Our results provide unique insight into the ontogeny of behavioral strategies used to navigate social group membership and the social function of imitation in early childhood.

Author Contributions

All authors developed the study concept and contributed to the study design. Testing and data collection were performed by R. E. Watson-Jones. R. E. Watson-Jones performed the data analysis and interpretation under the supervision of C. H. Legare. R. E. Watson-Jones drafted the manuscript, and C. H. Legare and H. Whitehouse provided critical revisions. All authors approved the final version of the manuscript for submission.

Acknowledgments

We thank Adrian Abellanoza, Lukas Thompson, Eric Harvey, Sarah Mohkamkar, Rebecca Nikolaichuk, Alex Carr, Courtney Crosby, Lacey Hutchinson, Casey Brown, Irene Jea, Emily Shanks, Emily Eck, Emma Denning, and Kasia Szostak for assistance with data collection and coding.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Funding

This work was supported by United Kingdom Economic and Social Research Council Grant RES-060-25-0085 (to C. H. Legare and H. Whitehouse).

Open Practices

The data set for the imitation data can be accessed at <http://dx.doi.org/10.13140/RG.2.1.2188.2088>. The data set for the emotional-reaction data can be accessed at <http://dx.doi.org/10.13140/RG.2.1.3761.0721>. The complete Open Practices Disclosure for this article can be found at <http://pss.sagepub.com/content/by/supplemental-data>.

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