

IN PRESS, *Psychological Science*

In-group ostracism increases high fidelity imitation in early childhood

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This work was supported by a grant to the second and third authors from the UK's Economic and Social Research Council (RES-060-25-0085). Special thanks to David Buss for insightful feedback and to 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.

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Abstract

The Cyberball paradigm was used to examine the hypothesis that high fidelity imitation serves as a reinclusion behavior in response to experiencing ostracism from in-group members. Children ($N = 176$, 5-6-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 performing a social group convention. Participants who were excluded by their in-group engaged in higher fidelity imitation than those that were included by their in-group. There was no difference in imitative fidelity between children that were included or excluded by an out-group. 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

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Humans have evolved a variety of psychological adaptations for group living (Kurzban & Neuberg, 2005). Infants (Buttelman, Zymj, Daum, & Carpenter, 2013; Powell & Spelke, 2012) and preschool children (Rhodes, 2012) are highly sensitive to social categories. Children as young as 4-years-old prefer in-group members based on 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 others 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 group membership alone (Wen, Herrmann, & Legare, in press). These results support the proposal that rituals facilitate in-group cohesion (Henrich, 2009; Legare & Watson-Jones, 2015; Whitehouse & Lanman, 2014). We propose 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 ostracism (Buss, 1990; Kerr & Levine, 2008). Using primarily self-report measures with adults and adolescents, an extensive body of research has examined how ostracism threatens an individual's sense of belonging, self-esteem, meaningful existence, and control (see Williams, 2007 for a review). Recent research suggests that ostracism may threaten different needs across development. Self-esteem is most threatened for younger children (8-9-

year-olds), whereas belonging is most threatened for adolescents and adults (Abrams, Weick, Thomas, Colbe, & Franklin, 2010).

Beyond detecting the threat of ostracism, individuals must also engage in an appropriate behavioral response to ostracism. Rejection by an individual is distinct from ostracism by a group and results in different responses, such as withdrawal (Williams, 2007). Previous research with adults has demonstrated that the first response to ostracism is attempts at reinclusion (Bozin & Yoder, 2008; Carter-Sowell, et al., 2008). For example, when ostracized by in-group members, individuals increase behavioral mimicry (non-consciously imitating the actions of an interaction partner) as a means of increasing liking and rapport (Lakin, Arkin, & Chartrand, 2008).

Like adults, young children may use imitation as a behavioral strategy to reaffiliate with in-group members following ostracism. 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 recently 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 an out-group (Buttelman, et al., 2013). Thus, we expect preferential imitation of in- versus out-group members to be consistent across development.

Our objective was to examine how a first-hand experience of ostracism versus inclusion by in- versus out-group members affects young children's imitative fidelity of a social group

convention. Whereas there has been much research examining adults' and adolescents' self-reported responses to an experience of ostracism (Killen & Rutland, 2011; Williams, 2007), one study with elementary school children (Nesdale, et al., 2007), and studies of the neurological response of elementary school children to social exclusion (Bolling, et al., 2011), little is known about young children's behavioral responses to ostracism from in-group versus out-group members. High-fidelity imitation may be used as a reinclusion behavior in response to ostracism from an in-group in early childhood, in ways that parallel the increase in motor mimicry following ostracism by in-group members observed in adults (Lakin, et al., 2008). Given previous self-report results with adults (Williams, Cheung, & Choi, 2000; Wirth & Williams, 2009), however, ostracism may impact imitative fidelity regardless of group membership. This would provide evidence of the early emerging sensitivity and behavioral response to ostracism and support the hypothesis that an ostracism-detection and response system is an evolved aspect of psychology (Kerr & Levine, 2008).

To examine children's sensitivity to ostracism we also explore affective responses, given previous research demonstrating its negative impact on wellbeing. We expect that children will display a negative affective response to the experience of ostracism. The current study is the first to examine young children's affective responses to ostracism and will thus provide an indicator of its emotional impact as a potential mediator of children's behavioral responses.

The current study thus represents a unique synthesis of previous research on the early-emerging motivation to engage in imitative fidelity of group-specific conventions as an affiliative behavior in response to ostracism. This study is the first to examine: (a) whether imitative fidelity of a group convention (a behavioral measure) is higher after ostracism versus inclusion from in- versus out-group members in early childhood, and (b) children's affective

response to ostracism. We chose a social-conventional action sequence (arbitrary actions that contained no clear end-goal, Legare et al., 2015) because children interpret them 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 and thus moves beyond research on how children use social-conventional reasoning to judge inter- and intra-group relations (Killen & Rutland, 2011) to examine how they use performance of social conventions as reinclusion behavior.

To examine the experience of ostracism versus inclusion in the context of in-groups versus out-groups, a novel group paradigm was used to manipulate group membership (Dunham, et al., 2011; Tajfel, 1970). Next, Cyberball, a virtual ball-tossing game, was used to manipulate the experience of ostracism versus inclusion (Williams, Yeager, Cheung, & Choi, 2012). We selected inclusion as a comparison condition due to its common usage as a control group in ostracism research (Williams, 2007). Children were either included or excluded by in-group members or out-group members. They had an opportunity to imitate an in-group member, if they played with in-group members, or an out-group member, if they played with out-group members. The current experiment, to our knowledge, is the first to use Cyberball with young children (5-6-year-olds) and will provide insight into its viability as a manipulation of social exclusion in early childhood.

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 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) imitative fidelity of an out-group convention would not differ between those that were included

or excluded by their out-group. We also predicted that children ostracized by their in-group would display more negative affective responses than children ostracized by out-group members; notably higher levels of anxiety and frustration.

Method

Participants

A total of one hundred-seventy-six 5-6-year-olds (M age 5.92; range 5,0 to 6,11) were recruited from a university town in the American southwest. Participants ($N = 176$, 96 female) were primarily Euro-American and from middle-class families. Eleven participants were excluded due to experimenter error, parental interference, or their choice to terminate the session. Power was based on a medium expected effect size ($n_p^2 = .060$), which yielded a total sample size of 176 participants.

Design

We used a 2 x 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 group membership to the “yellow group”. The green group was assigned as the out-group across conditions. Cyberball was used as an experimental paradigm for manipulating a first person experience of ostracism or inclusion (Williams, et al., 2012).

Materials and Procedure

All parents signed a consent form and all children provided oral assent to participate in the study. When the child sat down with the experimenter, they were told, “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 children 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. Following 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 the video demonstration of an in-group member or out-group member engaging in a novel social group convention. 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 to show that individuals within the yellow group have similar preferences to the participant as a means of increasing a sense of shared experience and preference. The Powerpoint began on a screen with a child's drawing of two children wearing yellow and holding a yellow balloon. Clicking on the drawing took participants to the next slide in which they were presented with pictures of three animals (i.e., a dog, a cat, and a horse). Participants were asked to click on the animal that was their favorite. Regardless of which animal they picked they were taken to a slide that had a picture of the animal they chose next to the drawing from the start slide and were told, "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 slide).

Cyberball. Following the training task, to prime ostracism versus inclusion, participants played 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 (Figure 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”. In the in-group conditions, participants were told that the children in the other rooms were also part of the yellow group. In the out-group conditions, participants were told that the children in the other rooms were part of the other (green) group. Next participants were told, “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?”

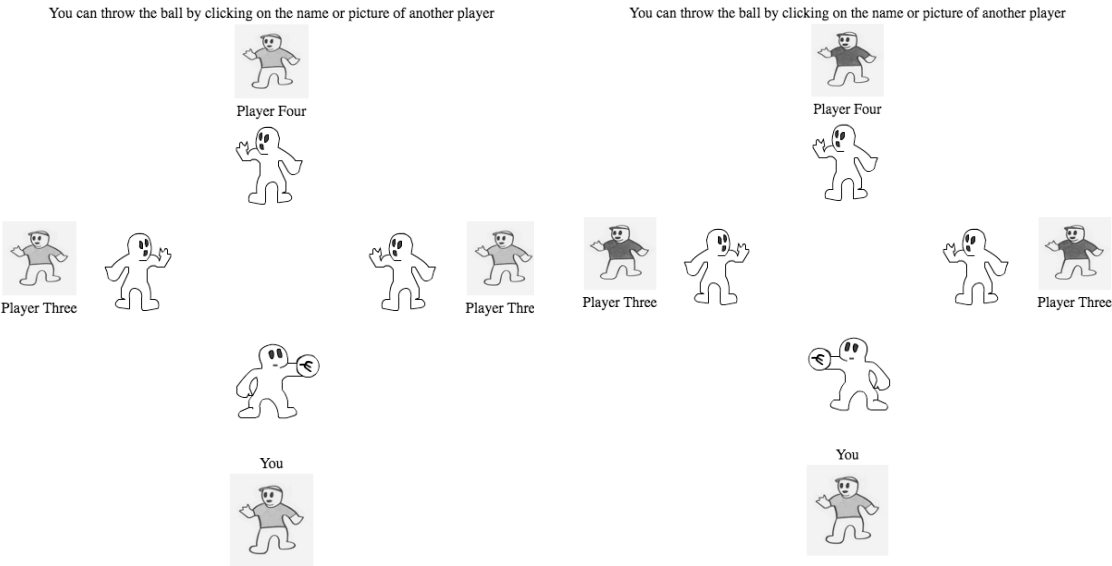


Figure 1. Cyberball screenshots of in-group (left) conditions where all of the figures wore yellow t-shirts, and out-group conditions (right) where three of the figures wore green t-shirts and the participants’ figure wore a yellow t-shirt.

Ostracism conditions. When the game began, participants saw their player at the bottom center of the screen in a yellow shirt. Participants saw the three other players, wearing yellow shirts within the in-group conditions and green shirts within the out-group conditions, to the

upper left, upper right, and upper center of the screen (Wirth & Williams, 2008). The player on the left holds the ball and tosses it to either the participant or one of the other players.

Participants received 3 ball tosses and then were left out of the game for the remaining two minutes of game play. The ball was thrown a total of 30 times within the ostracism conditions. Meaning the participant witnessed the ball being passed 27 times.

Inclusion conditions. The inclusion conditions were identical to the ostracism conditions except that participants were tossed the ball periodically throughout the game. The ball was also thrown a total of 30 times within the inclusion conditions. Meaning the participants in the inclusion conditions were passed the ball 7 to 8 times during the game.

Affective response coding. To assess affective responses to the experience of ostracism by an in- versus an out-group, children's facial, postural, and verbal displays (similar to coding described by Coan & Gottman, 2007) were coded from the video during the time participants played the Cyberball game (duration of 2-3 minutes) by a research assistant, unaware of the hypothesis. Children were coded for displays of anxiety (such as slumping posture, raised inner eyebrows, frowns, sighs, and verbal statements about being upset that they were being left out) and frustration (such as a furrowed brow, pursed lips, and verbal statements indicating frustration at being left out) within 15 second intervals while they were playing the Cyberball game (total of 7-11 15-second intervals). Children received a 1 if they displayed any sign of frustration during each interval, and a 0 if they did not. If children displayed any signs of anxiety during each 15 second interval they received a 1, if not they received a 0. For this coding, 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 a proportion of displays of anxiety and a proportion of displays of frustration the occurrence of anxiety and the occurrence of frustration per 15-second intervals were summed

across participants and divided by the total number of intervals in which they played the game (7-11 intervals total).

Video demonstration of novel social group convention. Following Cyberball, participants were shown a video demonstration (for continuity in presentation) of an adult engaging in a novel social group convention. For the in-group video the model was wearing a yellow shirt, visor, and wristbands. For the out-group condition the same model was wearing a green shirt, visor, and wristbands. Each video was 20 seconds in length. The stimuli included a blue cube, orange sphere, purple piece, and a wooden peg-board (with three wooden pegs, colored yellow, red, and green).

The demonstration included 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 is placed on the body; and 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.

Prior to playing the video, conventional language was used to reinforce 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." In the out-group conditions participants were told, "This is how the green group always does it." The video begins with the demonstrator sitting behind a table with objects in front of her and her hands placed flat on the table with a tray of objects placed in front of her (the wooden peg board, blue cube, orange sphere, and purple piece. The demonstrator lifts her left fist and places her chin on her fist. The demonstrator then lifts her right hand and swipes her index finger across her right eyebrow in a sweeping motion from left to right after which she immediately picks up the blue cube which she first presses on her

forehead and then moves over the green peg on the pegboard, taps on the green peg twice and places the blue cube back on the tray. The demonstrator then swipes her finger across her eyebrow as before. The demonstrator then picks up the orange sphere, presses the orange sphere to her forehead, and then moves over the red peg and taps on the red peg twice then places the sphere back on the tray. She then swipes her eyebrow again, then places her hands back flat on the table (Figure 2).



Figure 2. Screenshots of the video demonstration. In the in-group conditions, the model was wearing all yellow. In the out-group conditions, the model was wearing all green.

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. 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 seconds to interact with the objects before the objects were moved from within reach, but kept within view.

Imitative fidelity coding. One research assistant who was unaware of the conditions and hypothesis completed 100% percent of the coding to compare to coding completed by the first author. Imitative behavior was coded for the elements of the action sequence: Object-peg pairings (1) blue cube on green peg, (2) orange sphere on red peg, (3) engaging in double tapping action, (4) engaging in the correct sequencing (i.e. using the blue cube first, then the orange sphere), (5) reproduction of the modeled forehead swiping, and (6) pressing an object to the forehead. If children produced the target behaviors they were given a score of 1; if not, they were given a score of 0. An imitative fidelity score was calculated based on these six elements of the action sequence. Because only one participant reproduced the modeled postural element of placing their fist underneath their 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. All participants were asked if they had any questions about the game or the experiment in general.

Inter-rater reliability

A separate coder, unaware of the conditions and hypothesis, recoded the entire data set. Inter-rater reliability was high for the imitative fidelity summary score Cohen's Kappa = .85. Any coding discrepancies were resolved through discussion for 100% agreement. For the affective response coding, a separate coder, also unaware of the conditions and hypothesis, recoded the data from 22 children, representing 25% of the total sample (drawn from the in-

group ostracism condition and the out-group ostracism condition, $n = 88$). Inter-rater reliability was calculated via intraclass correlations (Coan & Gottman, 2007) and found to be excellent for the frustration coding, $ICC(2, 21) = .96, p = .0001$, and the anxiety coding, $ICC(2, 21) = .90, p = .0001$.

Results

Imitative fidelity

An ANOVA with prime (2: ostracism, inclusion) and group (2: in-group, out-group) as between-subjects variables and the 0-6 imitative fidelity score as the dependent measure revealed a main effect of prime, $F(1, 172) = 6.07, p = .015, \eta_p^2 = .034$. Planned comparisons with Bonferroni correction revealed that children in the ostracism conditions ($M = 3.38, SD = 1.01$) had higher imitative fidelity scores than children in the inclusion conditions ($M = 2.84, SD = 1.01$), $p = .034, M_{diff} = .534, 95\% CI [.106, .962]$. There was no main effect of group, $F(1, 172) = .223, p = .638$. Children in the in-group conditions did not have higher imitative fidelity scores ($M = 3.16, SD = 1.01$) than children in the out-group conditions ($M = 3.06, SD = 1.01$). There was also no interaction between prime and group, $F(1, 172) = 1.21, p = .272$ (Figure 3). To examine the impact of ostracism and group membership on imitative fidelity, planned Bonferroni corrected comparisons were conducted. Tests of the simple effects of prime within group revealed that children in the in-group ostracism condition ($M = 3.55, SD = 1.27$) had higher imitative fidelity scores than children in the in-group inclusion condition ($M = 2.77, SD = 1.49$), $F(1, 172) = 6.36, p = .013, \eta_p^2 = .036, M_{diff} = .773, 95\% CI [.168, 1.38]$. Imitative fidelity scores of children in the out-group ostracism condition ($M = 3.20, SD = 1.44$) did not significantly differ from the imitative fidelity scores of children in the out-group inclusion condition ($M = 2.91, SD = 1.54$), $F(1, 172) = .929, p = .336$. Tests of the simple effects of group within prime

revealed that the imitative fidelity scores of children in the in-group ostracism condition did not differ from those of the children in the out-group ostracism condition, $F(1, 172) = 1.24, p = .268$. Finally, the imitative fidelity scores of children in the in-group inclusion condition did not differ from those in the out-group inclusion condition, $F(1, 172) = .198, p = .657$.

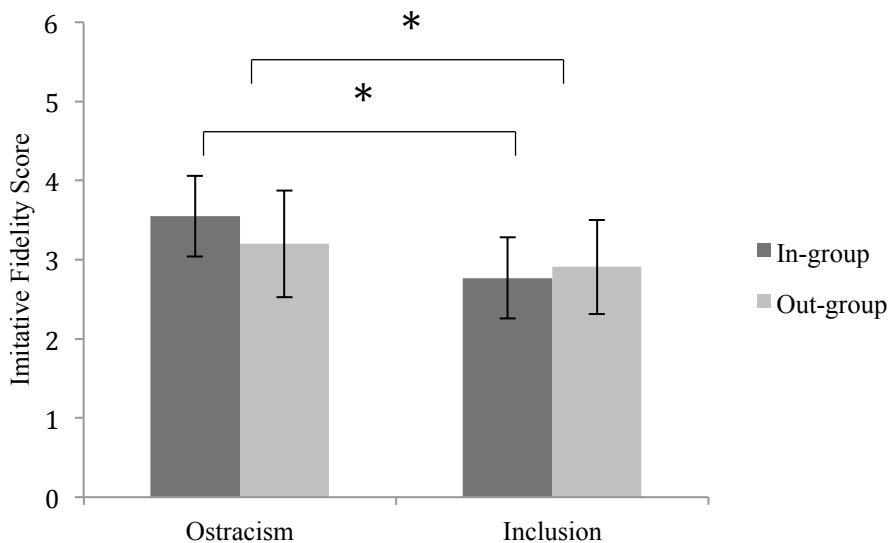


Figure 3. Mean accuracy in imitative fidelity score for prime and group. Error bars represent 95% CI.

Affective response

To examine affective response within the ostracism conditions (in-group ostracism and out-group ostracism) we computed proportions of anxiety displayed anxiety and proportions of frustration displayed by summing the occurrence of anxiety and frustration for each 15 second time period while the children were playing Cyberball and then dividing that number by the total number of 15 second time periods they were engaged in the game. T-tests were conducted to compare displays of anxiety and displays of frustration between the in-group ostracism and out-

group ostracism conditions. Displays of anxiety were significantly higher in the in-group ostracism condition ($M = .21$, $SD = .21$) than in the out-group ostracism condition ($M = .12$, $SD = .18$), $t(86) = 2.05$, $p = .043$, $d = .46$, $M_{diff} = .09$, 95% CI [.003, .167]. There was however, no difference between the in-group ostracism condition ($M = .14$, $SD = .18$) and the out-group ostracism condition ($M = .11$, $SD = .18$) in displays of frustration, $t(86) = .969$, $p = .335$.

To examine if anxiety or frustration were related to imitative fidelity, Pearson correlations were conducted. Neither anxiety, $r = .179$, $n = 88$, $p = .245$, nor frustration, $r = -.043$, $n = 88$, $p = .783$, were correlated with the imitative fidelity summary scores. To explore the possibility that anxiety mediates imitative fidelity differentially by condition a Sobel mediation test was conducted. Results of the Sobel test indicate that anxiety is not a mediator of imitative fidelity ($z' = .314$, $p = .753$).

Discussion

The current research provides evidence that young children are sensitive to ostracism and respond in similar ways as 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 & Flessler, 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 ostracism –ostracism 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, using Cyberball, on a behavioral response in early childhood. Thus, this research demonstrates that the behavioral response to ostracism observed in adults is early emerging, lending support to the hypothesis that an ostracism-detection and response system 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 (Buttelman, et al., 2013). One potential explanation is that the novel group paradigm may not influence behavior in the same way it influences self-reported preferences and attitudes. Future research should examine the conditions under which varying strengths of group membership affects behavioral responses as well as the impact of ostracism by in- versus on 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.

Children ostracized by in-group members displayed significantly more anxiety than children ostracized by out-group members. We did not, however, find an effect of in- versus out-group ostracism on displays of frustration. Across ostracism conditions children's participation in the game was thwarted and therefore children experienced similar levels of frustration. Thus, ostracism 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, however, did not

mediate children's imitative fidelity. Thus even though children are having a more negative emotional response to the experience of ostracism from in-group members, it is not influencing their behavioral response. Future research should examine what mediates behavioral responses following an experience of ostracism.

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 following ostracism. Would children be equally likely to imitate a negative (morally proscribed) behavior when under the threat of ostracism 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 they can be trusted and are valuable group members. We predict that, if children feel threatened with ostracism 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 ostracism 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.

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