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The Impact of Ostracism on Moods and Fundamental Needs

Being ostracized is a negative experience. It causes a reduction in positive affect (e.g., happiness) as well as an increase in negative affect (e.g., anger, anxiety, and sadness; see Williams, 2007, for a review). Under some conditions, ostracism has also led targets to experience “cognitive deconstruction” or affective numbness (e.g., Blackhart, Nelson, Knowles, & Baumeister, 2009; DeWall & Baumeister, 2006). The adverse impact of ostracism is a surprisingly robust finding that holds up across a wide range of experimental iterations, including situations in which the rejection is virtual (e.g., Williams, Cheung & Choi, 2000), the excluders are unknown (Zadro, Williams, & Richardson, 2004), and even when the excluders are actively disliked by the target (Gonsalkorale & Williams, 2007). The bottom line across varying methodologies and contexts is that exclusion hurts. Indeed, research over the past decade has revealed that the same neural circuits underlying physical forms of pain are activated in situations involving social ostracism (Eisenberger, Lieberman, & Williams, 2003).

According to the need-threat model of ostracism (Williams, 2009), ostracism threatens four fundamental needs: belonging, control, self-esteem, and meaningful existence. The *need to belong* is threatened by signaling a separation between self and others: The ostracized person is no longer included in the social group and this threatens the need for belonging (see also Baumeister & Leary, 1995). The *need for control* is threatened because the ostracized person cannot influence the progression of the relationship (i.e., ostracism is unilateral). Self-esteem—or the *need for self-worth*—is negatively affected because ostracism makes people feel unworthy, unlikeable, or ineffectual. Finally, the *need for meaningful existence*—or the *need for recognition*—is threatened because the experience of ostracism leads people to experience what it would be like if they did not exist and reminds them of the fact that their existence is temporary.

Support for the need-threat model of ostracism mainly comes from studies conducted among adults (e.g., Van Beest & Williams, 2006; Williams et al., 2000; see, for a review, Williams & Nida, 2011). More recently, the effects of ostracism on mood and fundamental needs have been experimentally assessed in younger populations as well. A few studies have directly compared multiple age groups ranging from adolescence to adulthood. Pharo, Gross, Richardson, and Hayne (2011) reported that ostracism had a negative effect on the moods and fundamental needs of adolescents, emerging adults, and young adults, with the impact of

ostracism on need fulfillment being larger for the adolescents and emerging adults than for the young adults (Pharo et al., 2011). In a related study of an all-female sample, Sebastian, Viding, Williams, and Blakemore (2010) reported that ostracism had similarly negative effects on mood and needs fulfillment of early adolescents, mid-adolescents, and adults.

To date, there are only a few studies that specifically examine how *children* respond to ostracism. This is surprising, as being rejected, excluded, and ignored is an experience that is all too common among school-aged children (Stassen Berger, 2007). We know that victimized children who are repeatedly exposed to rejection and exclusion in daily life are at greater risk for experiencing a range of negative outcomes including depression, anxiety, loneliness, withdrawn behavior, and suicide ideations and attempts (Hawker & Boulton, 2000; Reijntjes, Kamphuis, Prinzie, & Telch, 2010). Therefore, more detailed knowledge on the effects of discrete acts of ostracism on children’s well-being may be useful in understanding and reducing its ill-effects in the everyday lives of socially vulnerable children.

In one of the few studies to examine the impact of ostracism among younger children, Ruggieri, Bendixen, Gabriel, and Alsaker (2013) reported that 10–14 year-old children who had been assigned to an ostracism condition reported lower levels of positive mood and need fulfillment than their socially included counterparts. In a related study designed to explore potential developmental changes in the impact of ostracism on mood and need fulfillment across middle childhood and adolescence, Abrams, Weick, Thomas, Colbe, and Franklin (2011) found that the negative impact of ostracism was substantial and largely consistent among children (8–9 years old), adolescents (13–14 years old), and young adults (on average 20 years old; Abrams et al., 2011). Taken together, these studies suggest that the negative psychological consequences of ostracism are robust across developmental periods.

Severity of Ostracism

A second important question about the impact of ostracism has to do with the *severity* of the experience. Are all forms of ostracism equally painful, or does the number of excluders relative to number of inclusive members influence the strength of the psychological blow? Although a number of different experimental manipulations have been used to elicit ostracism, (see Williams, 2007 for review), most studies assign participants to conditions in which they are either completely included or completely excluded by others. Far less is known about how people respond when group feedback is mixed.

Three studies have examined the effect of partial ostracism among adult samples. DeWall, Twenge, Bushman, Im, and Williams (2010) had undergraduates play a game of Cyberball in which they were randomly assigned to be excluded by 0, 1, 2, or 3 other players. Results revealed a negative and linear association between number of inclusive partners and participants' report of negative affect, with each additional inclusive member having a smaller impact on reducing the participant's distress (DeWall et al., 2010). Abayhan and Aydin (2014) found a similar pattern when they examined the impact of partial ostracism on need threat in a sample of Turkish adults who were randomly assigned to a "Get Acquainted" paradigm in which they interacted with varying numbers of accepting partners. In both studies, number of inclusive group members had an incrementally beneficial effect on targets' response to ostracism. Complete ostracism elicited the most negative impact, followed by varying degrees of partial ostracism. Chernyak and Zayas (2010) used a three-person Cyberball paradigm to compare how participants responded to being ostracized by both partners with being ostracized by only one partner while the other remained inclusive. In contrast to an incremental pattern, these results revealed that the negative impact of ostracism was just as potent in the one-person as in the two-person condition.

Partial Ostracism in Childhood

To our knowledge, no prior experimental work has examined the impact of number of excluding and inclusive group members on children's response to ostracism. According to the incremental model supported in adult samples, complete ostracism should elicit more distress than any form of partial ostracism, with increasing numbers of inclusive peers systematically reducing the negative impact. There is some evidence from naturalistic studies of children to support the first part of this premise. For example, having a best friend predicts less continuous rejection for socially vulnerable children than having no best friend (Parker & Asher, 1993). Further, victimized children who report that none of their peers come to their defense when they are maltreated report lower levels of self-esteem, are viewed as more disliked by their classmates, and report more frequent ongoing victimization than victimized children who are defended by at least one of their peers (Sainio, Veenstra, Huitsing, & Salmivalli, 2011). Clearly, receiving support from just *one* friend or classmate is associated with fewer negative outcomes for socially vulnerable children than receiving no peer support at all.

But what about varying degrees of partial ostracism? Do children respond to ostracism with incrementally less distress as the number of inclusive peers in the group

increases? Naturalistic and correlational studies provide some evidence to support an incremental model. For example, Kärnä, Voeten, Poskiparta, and Salmivalli (2010) reported that victimized children scored higher on measures of peer rejection and social anxiety as the number of classmates who supported the bullying increased. Conversely, the higher the average rate of defending behavior in the classroom, the less likely victimized children were to feel anxious or to be actively rejected (Kärnä et al., 2010). These findings support the notion that non-supportive peers incrementally exacerbate the harmful effects of negative peer experiences, while supportive peers incrementally mitigate against them.

According to a strictly incremental model, we would expect the experience of minimal ostracism to be significantly more distressing than no ostracism at all. In other words, targets should be sensitive to the presence of even a lone ostracizer in an otherwise accepting group. From an evolutionary standpoint, this makes sense; we are hardwired to pay more attention to signs of threat than to indications of safety or inclusion (Kerr & Levine, 2008). Indeed, children as young as preschool age demonstrate a bias for noticing threatening faces, visually detecting their presence more quickly than happy or neutral faces (LoBue, 2009). If threatening social feedback is perceived as particularly salient and memorable, then children may be primed to experience deficits in mood and need fulfillment when faced with just *one* ostracizer in a group of otherwise inclusive members.

On the other hand, children's response to partial ostracism may deviate from a strictly incremental model. Another possibility is a "consensual" model in which group ostracism does not exert a negative effect until two or more peers act jointly to exclude a target. According to such a model, children would not perceive acts of ostracism as threatening unless there is some evidence of collusion or agreement between group members.

Consensual ostracism could pack more punch not only because it changes the power dynamic of the group, but also because it has the potential to change the sorts of attributions children make about the experience. After all, it is easier to externalize responsibility for an act of exclusion when it involves a single ostracizer (encouraging a target to ask "What is wrong with *that kid who is excluding me?*") than when it involves more than one (leading a target to wonder "What is wrong with *me?*"). Internal attributions for negative events, in turn, are likely to lead to more adverse effects. For example, children and adolescents who internalize blame for rejection report higher levels of depression and loneliness (Prinstein, Cheah, & Guyer, 2005), engage in more perseveration and

withdrawn behavior (Goetz & Dweck, 1980), produce more negative cognitive appraisals of failure feedback (Reijntjes, Dekovic, Vermande, & Telch, 2008), and are at greater risk for continued victimization over time (Schacter, White, Chang, & Juvonen, 2015). To the extent that consensual exclusion leads children to make more internal and characterological attributions for social failure, it could exert more potent effects on mood and need fulfillment.

Despite strong conceptual arguments supporting the uniquely negative impact of consensual ostracism, it is worth noting that the adult literature provides some evidence to the contrary. Results from a study employing a three-person Cyberball paradigm revealed that the impact of being ostracized by one partner was just as negative as being ostracized by two; the presence of an inclusive player did not buffer against the negative consequences of being ignored by an exclusionary player (Chernyak & Zayas, 2010). It is not clear, however, what role consensus might play in children's perceptions of ostracism.

Overview of the Present Study

To gain more evidence about the effects of ostracism in childhood, the present study consists of two Cyberball experiments in which children played a ball toss game with three players whom they believed to be classmates. Study 1 investigated the impact of being completely excluded versus being completely included on moods and fundamental needs. In Study 2, we systematically varied the numbers of excluders/includers in the Cyberball game in order to examine how variation in group composition affects children's responses to ostracism.

As a pair, these studies make several unique contributions to existing literature. First, they extend the developmental scope of previous research. In contrast to the smaller sample sizes used in previous examinations of children's response to complete inclusion or exclusion in a Cyberball game (Ns ranging from 40 to 90), we utilized a larger sample of 173 elementary school children. This allows us to explore whether gender might moderate the impact of ostracism on children's mood and need fulfillment. Further, Study 2 represents the first experimental examination of *partial* ostracism in childhood. By systematically manipulating the behavior of play partners in a Cyberball game, we are able to explore how children respond to ostracism as the number of inclusive versus excluding play partners shifts.

A second innovation in the current study involves the way in which we examine the impact of ostracism. The two prior studies on partial ostracism among adults assumed a linear association between number of excluders and negative impact, and used slope analyses

to test this premise. While results supported a linear association, the analyses did not allow for direct comparison between various partial ostracism conditions. In the current study, we directly compare conditions in which children are excluded by varying numbers of partners. This allows us to explore whether children experience partial ostracism in a strictly incremental manner, or whether a consensual model might apply for some moods and threatened needs.

Finally, a third advance in the current study is our use of non-aggregated scores for mood and threatened need states. DeWall et al. (2010) used a single aggregated score for negative affect as the primary dependent variable in their analysis of partial ostracism in adults. There is reason to believe, however, that individuals may experience complex reactions to ostracism in which various moods or threatened needs operate independently. For instance, individuals may respond to ostracism with a heightened sense of sadness but not anxiety, or with a threatened sense of belonging but not control. The current study examines positive and negative moods and threatened need states as separate dependent variables in order to explore potential variations in their sensitivity to partial ostracism.

Study 1: Inclusion Versus Exclusion

Study 1 examined the effects of ostracism on children's moods and fundamental needs when the children were either completely included or ostracized by all players. In accordance with previous research (Abrams et al., 2011; Hawes et al., 2012, 2013), we predicted that ostracism would negatively affect mood and the four fundamental needs in children. More specifically, we expected that ostracized children would experience more anger, anxiety, and sadness, less happiness, and greater deficits in their needs for belonging, control, meaningful existence, and self-esteem than included children.

In addition, we explore potential gender differences in children's response to ostracism. Prior research has demonstrated that girls are not only more likely to experience exclusionary gestures in everyday life than boys (Underwood, Scott, Galperin, Bjornstad, & Sexton, 2004), but are also more prone to experience intrapersonal negative feelings and thoughts as a result of victimization than boys (Galen & Underwood, 1997; Paquette & Underwood, 1999). Therefore, we speculate that girls might be more sensitive to ostracism than boys.

METHOD

Participants

Participants were 173 children from seven 3rd–5th grade classrooms from one school in the Netherlands.

Parents received a letter explaining the purpose and methods of the study, and were asked whether or not they consented for their children to participate. All materials were presented in Dutch. Children who received parental consent were told that they could refrain from participation beforehand or stop at any time during the experiment. Three children did not receive parental permission, one child was absent, one child had insufficient knowledge of Dutch, and one child could not complete the measures due to time constraints. The final sample, therefore, consisted of 167 children (52% girls; $M_{\text{age}} = 9.75$ years, $SD = .89$). The sample was predominantly Caucasian, with 96.5% of the children born in The Netherlands.

Materials

Cyberball. The Cyberball paradigm was used with minor adjustments (see Williams & Jarvis, 2006; Zadrozny et al., 2013). Children played against three pre-programmed players, depicted by animated figures and labeled as Player 1, Player 2, and Player 3 on the screen. The participant was represented by a hand at the bottom center of the screen and identified with her or his own name. Children were randomly assigned to an *inclusion* condition (receiving the ball 25% of the time) or an *ostracism* condition (receiving the ball twice from each player in the beginning, then never again). The game consisted of 60 trials and lasted approximately 3.5 min.

Manipulation check. To test whether the manipulation was successful, children were asked “How often did the other children throw the ball to you?” with answer options 1 = *less than to the others*, 2 = *just as much as to the others*, and 3 = *more than to the others*.

Moods. Four moods were assessed via computerized questionnaire: anger, anxiety, happiness, and sadness. Children were asked to indicate the extent to which they had experienced each mood during the Cyberball game on a 7-point scale (1 = *not at all*; 7 = *very much*). Moods were assessed with one question each.

Fundamental needs. The Need Threat Scale (Van Beest & Williams, 2006) was re-worded for use with children. The NTS assesses belongingness, control, meaningful existence, and self-esteem, with five questions for each need (20 total). Children were asked to think about how they felt during the Cyberball game. Example questions were: “I felt excluded” (belongingness), “I felt like the other players decided everything” (control), “I felt invisible” (meaningful existence), and “I felt like I was just as good as the other players” (self-esteem). Children rated each statement on a 7-point scale (1 = *not at all*; 7 = *very much*). Negatively formulated items were reverse coded. Mean scores for each five-item need scale were created with higher scores

indicating higher fulfillment of that need. Reliability (Cronbach’s α) was .90 for belongingness, .68 for control, .77 for meaningful existence, and .82 for self-esteem.¹

Procedure. The participating children in each classroom completed the experiment simultaneously on individual 10 inch netbook computers. We created space between the individual desks so that children could not look at each other’s computer screens. Privacy was further enhanced by placing table-top partitions around each desk and telling the children that the partitions marked their personal space that should be respected by everyone. The experimenters explained that we were interested in children’s opinions and that there were no right or wrong answers. Children could ask questions or stop at any time.

The current experiment was part of a larger study (van Noorden, Bukowski, Haselager, Lansu, & Cillessen, 2016), which included additional measures to the ones described here. After completion of those additional measures, the researchers announced that it was time to play a special computer game called Cyberball in which the children would be virtually throwing a ball amongst themselves and three classmates. Children were told that the netbooks were connected via a wireless network and that their partners would be randomly drawn from the classroom, but they would not know which classmates they were playing against. Children were asked to mentally visualize what was happening during the game, such as the location and the identity of the other players.

After the Cyberball game, the manipulation check was administered and children’s moods and fundamental needs were assessed via computerized questionnaire. Children were thoroughly debriefed about the game and were given the opportunity to ask questions. All children received a small gift and the teacher received a €10 book voucher as a token of our appreciation. The entire data collection session lasted about 1.5 hr; the measures used for this experiment took about 30 min to complete.

RESULTS

Descriptive Statistics

Means and standard deviations for all study variables are presented in Table I. Girls reported higher levels of

¹ We began by translating the Van Beest and Williams (2006) measure into Dutch, and then adapted the items to be more understandable for children. The resulting measure was pilot tested with 167 children. Based on a combination of reliability analyses and our experiences fielding children’s questions during pilot data collection, we edited several items that elicited confusion. Most edits involved reversing items so they were more understandable to children.

TABLE I. Means, Standard Deviations for all Outcome Variables (Study 1)

	Inclusion (<i>n</i> = 84)	Ostracism (<i>n</i> = 83)
	Mean (SD)	Mean (SD)
Moods		
Anger	1.31 _a (.79)	3.57 _b (2.11)
Anxiety	1.10 _a (.30)	1.19 _a (.80)
Happiness	6.04 _a (1.48)	3.17 _b (2.05)
Sadness	1.19 _a (.74)	2.67 _b (2.11)
Needs		
Belongingness	5.70 _a (1.26)	2.48 _b (1.42)
Control	5.25 _a (1.07)	2.94 _b (1.02)
Meaningful existence	5.94 _a (1.16)	3.33 _b (1.74)
Self-esteem	5.75 _a (1.23)	3.42 _b (1.54)

Note. Means that do not share identical subscripts were significantly different from one another in a post hoc comparison test.

anxiety than boys, $t(123.71) = -1.99$, $P = .049$, $d = .30$. There were no other gender differences.

Manipulation Check

As expected, there was a main effect of condition, $F(1, 165) = 56.83$, $P < .001$, $d = -1.16$, with ostracized children ($M = 1.23$, $SD = .59$) reporting that they received the ball less often than included children ($M = 1.96$, $SD = .67$).

Effect of Ostracism on Moods

A 2 (Condition) \times 2 (Gender) MANOVA on the four moods yielded a significant multivariate effect of condition, Wilks' $\lambda = .55$, $F(4, 160) = 32.77$, $P < .001$, $\eta_p^2 = .45$. To follow up on the multivariate effect of condition, we examined the univariate effects. Ostracized children reported significantly more anger, $F(1, 163) = 86.87$, $P < .001$, $\eta_p^2 = .35$, and sadness, $F(1, 163) = 36.22$, $P < .001$, $\eta_p^2 = .18$, and significantly less happiness, $F(1, 163) = 109.19$, $P < .001$, $\eta_p^2 = .40$, than included children. There was no univariate effect of condition on feeling anxious. There was no significant multivariate main effect of gender ($p = .173$, $\eta_p^2 = .04$), and the effect of ostracism on mood was similar for boys and girls, as the main effect of condition was not moderated by gender ($P = .136$, $\eta_p^2 = .04$).

Effect of Ostracism on Fundamental Needs

A 2 (Condition) \times 2 (Gender) MANOVA on the four needs yielded a significant multivariate effect of condition, Wilks' $\lambda = .36$, $F(4, 160) = 70.34$, $P < .001$, $\eta_p^2 = .64$. To follow up on the multivariate effect of condition, univariate effects were tested. Ostracized children reported significantly less fulfillment of belongingness, $F(1, 163) = 233.04$, $P < .001$, $\eta_p^2 = .59$, control, $F(1, 163) = 205.20$, $P < .001$, $\eta_p^2 = .56$,

meaningful existence, $F(1, 163) = 133.61$, $P < .001$, $\eta_p^2 = .45$, and self-esteem, $F(1, 163) = 140.10$, $P < .001$, $\eta_p^2 = .46$, than included children. Here again, there was no significant multivariate main effect of gender ($P = .201$, $\eta_p^2 = .04$), and the effect of ostracism on need fulfillment was similar for boys and girls, as the main effect of condition was not moderated by gender ($P = .283$, $\eta_p^2 = .03$).

Summary Study 1

Study 1 examined the effects of ostracism on children's moods and fundamental needs. Consistent with the findings of Abrams et al. (2011) and Ruggieri et al. (2013), ostracism evokes negative mood states and threatens fundamental needs in children. More specifically, ostracized children reported more anger and sadness, and less happiness than included children, although there was no effect of ostracism on anxiety. In addition, ostracized children reported significantly less fulfillment of all four fundamental needs than included children. There were no gender differences, indicating that being ostracized is experienced similarly by boys and girls.

Study 2: The Role of Inclusive Members in Childhood Ostracism

Study 2 explores the impact of the *severity* of the ostracism experience on mood and need fulfillment by systematically varying the number of inclusive versus exclusive members present in the group. First, we predicted that children in the complete ostracism condition (excluded by three peers; included by none) would report more negative mood and lower need fulfillment than children in any other condition. We based this prediction on the existing Cyberball literature documenting a strong negative impact of complete ostracism among children (Abrams et al., 2011; Ruggieri et al., 2013).

In addition to our expectation that complete ostracism would more negatively impact well-being than partial ostracism and full inclusion, we turned our attention to partial ostracism, and compared the impact of two different versions of group exclusion. In one condition, participants faced a single ostracizer in the context of two inclusive group members (minimal ostracism). In the other, they interacted with two ostracizers in the context of one inclusive peer (moderate ostracism). If children respond to partial ostracism in a manner similar to adults, we would expect a linear and incremental association between number of ostracizers and degree of negative impact. That is, we would expect children in the minimal ostracism condition (i.e., excluded by one peer and included by two) to report lower mood and need fulfillment than children who were included by all group

members. Further, we would expect children in the moderate ostracism condition to report lower mood and need fulfillment than children in the minimal condition.

We also explored the possibility that for some moods and threatened needs, children's response to partial ostracism might follow the pattern of a consensual, rather than a strictly incremental model. In these cases, we would expect children in the moderate ostracism condition (jointly excluded by two players) to experience significantly more negative impact than children in the fully included condition, while children in the minimal ostracism condition (excluded by only one player) would not differ from fully included children.

METHOD

Participants

A total of 838 children from 34 3rd, 4th, and 5th grade classrooms from 11 schools were recruited to participate in a larger data collection project. Forty-seven children (5.6%) did not participate, mainly due to illness (27 children, 3.2%), or because they did not receive parental permission (10 children, 1.2%). The sample predominantly consisted of children born in The Netherlands (96.8%). Children in the overall sample were randomly assigned to one of seven conditions. Study 2 included four of these conditions ($N=405$; 48.4% girls; $M_{\text{age}}=9.97$ years, $SD=1.04$).²

Materials and Procedure

The materials and the procedure were similar to Study 1, with minor adjustments as described below.

Cyberball. Because Study 1 showed strong effects of the manipulation, and in order to keep children motivated and to prevent restlessness, we reduced the number of trials from 60 to 50. This abridged Cyberball paradigm lasted approximately 3 min.

There were four conditions that differed in the degree to which children were included or ostracized by the other group members. In each condition, participants believed that they were playing with three of their classmates. In the *complete ostracism* condition, the child received the ball once from each of the three players in the beginning, then never again (i.e., *three excluders and 0 inclusive members*). In the *moderate ostracism* condition, the child received the ball once from Player 1 and once from Player 3 in the beginning, and then never again. Player 2 continued to throw the ball to the child 33.3% of the time over the course of the

game (i.e., *two excluders and one inclusive member*). In the *minimal ostracism* condition, the child received the ball once from Player 1 in the beginning, then never again. Players 2 and 3 continued to throw the ball to the child 33.3% of the time (i.e., *one excluder and two inclusive members*). Finally, in the *inclusion* condition, the child received the ball 33.3% of the time from each player (i.e., *0 excluders and three inclusive members*).

Manipulation check. There were three sets of manipulation check questions. First, children rated how often the three other players (1, 2, and 3) together threw the ball to them and to each other on a 7-point scale (1 = a lot less than to the other players; 4 = just as much; 7 = a lot more than to the other players). Second, children rated how often each other player individually threw the ball to them, using the same scale. Third, children indicated whether they and each of the other players were excluded during the game by circling "yes" or "no."

Fundamental needs. Some items of the Need Threat Scale (NTS) from Study 1 were slightly rephrased for further clarity. Once again, the final NTS-C included 20 questions, five for each need (see Appendix). Reliability (Cronbach's α) for the scales was .92 for belongingness, .70 for control, .81 for meaningful existence, and .76 for self-esteem.

RESULTS

Descriptive Statistics

Means and standard deviations for all variables are presented in Table II. Boys and girls differed on two variables: boys reported significantly higher levels of anger ($M=2.39$, $SD=2.01$) than girls ($M=1.91$, $SD=1.51$; $F(1, 399)=7.28$, $P=.007$, $d=.27$), and boys experienced more control ($M=2.95$, $SD=1.40$) than girls ($M=2.81$, $SD=1.36$; $F(1, 399)=4.22$, $P=.041$, $d=.10$).

Manipulation Checks

The ANOVAs on children's perceptions of how often the ball was thrown to them and to Players 1, 2, and 3 all yielded a significant effect of condition, $F(3, 397)=85.33$, 21.77, 23.27, and 8.66, respectively, all $P_s < .001$. As children were more ostracized, they reported that the ball was thrown less to them and more to the other players. The ANOVAs on children's perceptions of how often Players 1, 2, and 3 individually threw the ball to them all yielded a significant effect of condition, $F(3, 397)=73.94$, 73.85, and 81.22, respectively, all $P_s < .001$. As children were more ostracized, they reported that the ball was thrown less to them by each individual other player. The ANOVA on children's overall sense that they were ostracized during Cyberball

²These data were part of a larger study in which additional participants ($N=303$) in three conditions played a version of Cyberball in which (i) they themselves were over-included; (ii) another player was ostracized by one player; (iii) another player was ostracized by two players.

TABLE II. Means, Standard Deviations for all Outcome Variables (Study 2)

	Inclusion (<i>n</i> = 115)	Minimal Ostracism (<i>n</i> = 109)	Moderate Ostracism (<i>n</i> = 111)	Complete Ostracism (<i>n</i> = 114)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Moods				
Anger	1.32 _a (0.90)	1.58 _{a,b} (1.33)	2.18 _b (1.75)	3.45 _c (2.09)
Anxiety	1.06 _a (0.40)	1.10 _a (0.43)	1.06 _a (0.36)	1.11 _a (0.50)
Happiness	5.71 _a (1.74)	5.53 _a (1.74)	4.77 _b (2.21)	3.42 _c (2.13)
Sadness	1.17 _a (0.64)	1.14 _a (0.46)	1.36 _a (1.11)	2.46 _b (2.01)
Needs				
Belongingness	6.07 _a (1.05)	5.50 _a (1.42)	4.31 _b (1.78)	2.28 _c (1.56)
Control	3.48 _a (1.26)	3.15 _a (1.31)	2.68 _b (1.26)	2.05 _c (1.10)
Meaningful existence	5.73 _a (1.07)	5.24 _a (1.33)	4.26 _b (1.62)	2.62 _c (1.44)
Self-esteem	5.41 _a (1.14)	4.74 _b (1.37)	4.34 _b (1.44)	3.02 _c (1.33)

Note. Means that do not share identical subscripts were significantly different from one another in a Scheffe post hoc comparison test.

also yielded a significant effect of condition, $F(3, 397) = 85.51, P < .001$, indicating that as children were more ostracized, they also felt more ostracized. There was no significant effect of condition on children’s perceptions of whether any of the other players were ostracized.

Effects of Ostracism on Mood

A 4 (Condition) × 2 (Gender) MANOVA on the four moods yielded significant multivariate effects of condition, Wilks’ $\lambda = .70, F(12, 1032.14) = 12.37, P < .001, \eta_p^2 = .11$, and gender, Wilks’ $\lambda = .97, F(4, 390) = 3.30, P = .011, \eta_p^2 = .03$. The multivariate main effect for condition was caused by significant univariate effects for feeling angry, happy, and sad, but not for feeling anxious. The multivariate main effect of gender was driven by a univariate effect for feeling angry.

For anger, there was a main effect for condition, $F(3, 393) = 37.13, P < .001, \eta_p^2 = .22$. Scheffe post hoc comparisons showed that children experienced significantly more anger in the extreme ostracism condition than in any other condition, and more anger in the moderate ostracism condition than in the inclusion condition. The inclusion and minimal ostracism conditions, and the minimal and moderate ostracism conditions did not differ from each other (see Table II). There was also a main effect for gender, $F(1, 393) = 10.08, P = .002, \eta_p^2 = .03$. Boys reported experiencing more anger than girls.

For happiness, there was a main effect of condition, $F(3, 393) = 29.75, P < .001, \eta_p^2 = .19$. Scheffe post hoc comparisons showed that happiness was significantly different between all conditions (except between minimal ostracism and inclusion groups which did not differ; see Table II). For the conditions that differed significantly from each other, the presence of more inclusive members relative to ostracizers was associated with more happiness.

For sadness, there was a main effect of condition, $F(3, 393) = 22.16, P < .001, \eta_p^2 = .15$. Scheffe post hoc comparisons showed that children reported more sadness in the extreme ostracism condition than in any of the other conditions, which did not differ from each other (see Table II).

Effects of Ostracism on Fundamental Needs

A 4 (Condition) × 2 (Gender) MANOVA on the four needs revealed a significant multivariate effect of condition, Wilks’ $\lambda = .48, F(12, 1032.14) = 27.10, P < .001, \eta_p^2 = .22$, and gender, Wilks’ $\lambda = .98, F(4, 390) = 2.50, P = .043, \eta_p^2 = .03$. The multivariate main effect for condition was caused by significant univariate effects for all four fundamental needs. The multivariate main effect of gender was driven by a univariate effect for need for control.

For need to belong, there was a main effect of condition, $F(3, 393) = 126.81, P < .001, \eta_p^2 = .49$. Scheffe post hoc comparisons showed that fulfillment of the need to belong differed between all conditions, except between the inclusion and minimal ostracism conditions (see Table II). For the conditions that differed significantly from each other, the presence of more inclusive members relative to ostracizers was associated with higher fulfillment of the need to belong.

For control, there was a main effect of condition, $F(3, 393) = 24.40, P < .001, \eta_p^2 = .16$. Scheffe post hoc comparisons showed that fulfillment of the need for control also differed between all conditions, except between the inclusion and minimal ostracism conditions (see Table II). For the conditions that differed significantly from each other, the presence of more inclusive members relative to ostracizers was associated with higher fulfillment of the need for control. There was also a main effect for gender, $F(1, 393) = 4.61, P = .032, \eta_p^2 = .01$. Boys reported more fulfillment of the need for control than girls.

For meaningful existence, there was also a main effect of condition, $F(3, 393) = 96.82$, $P < .001$, $\eta_p^2 = .43$. Scheffe post hoc comparisons showed that fulfillment of the need for meaningful existence also differed between all conditions, except between the inclusion and minimal ostracism conditions (see Table II). For the conditions that differed significantly from each other, the presence of more inclusive members relative to ostracizers was associated with higher fulfillment of the need for meaningful existence.

For self-esteem there was a main effect of condition, $F(3, 393) = 54.86$, $P < .001$, $\eta_p^2 = .30$. Scheffe post hoc comparisons showed that fulfillment of the need for self-esteem differed between all conditions, except between the minimal and moderate ostracism conditions (see Table II). For the conditions that differed significantly from each other, the presence of more inclusive members relative to ostracizers was associated with higher fulfillment of the need for self-esteem.

Summary Study 2

Study 2 investigated the effects of the *severity* of ostracism on children's moods and fundamental needs by varying the number of excluders relative to the number of inclusive members in the group. The results replicated our primary finding from Study 1; complete ostracism negatively affects children's moods (except for anxiety), and decreases the fulfillment of fundamental needs compared to full inclusion. Once again, these ostracism effects were not moderated by gender.

Study 2 revealed that the severity of ostracism has an impact on children's mood and sense of need fulfillment. In line with our first hypothesis, we found that being ostracized by all three group members was a more adverse experience than any other group configuration across all moods and fundamental needs except anxiety. This finding underscores the negative impact of complete exclusion for children.

In terms of partial ostracism, the relative negative impact of minimal and moderate ostracism varied across outcomes. In contrast to the incremental association between number of ostracizers and negative impact previously found in adult samples, our results suggest that for some outcomes, children are especially sensitive to situations in which two or more peers collude to keep them out of the group. Children in the minimal ostracism condition reported significantly lower self-esteem than children in the inclusive condition. In contrast, minimal ostracism had no impact on any other outcomes. In the case of anger, happiness, need for control, need for belonging, and need for meaningful existence, ostracism did not have an impact unless children were faced with at least two excluding peers. In the case of sadness, there were no significant differences between moderate

ostracism, minimal ostracism, and inclusion conditions, suggesting that complete ostracism has most impact for this outcome.

GENERAL DISCUSSION

This research addressed two related goals in two separate studies. The first goal was to replicate previous research demonstrating that ostracism negatively affects school-aged children's moods and fundamental needs (Study 1). The second goal was to extend existing literature by examining how the number of excluders relative to inclusive group members influences the negative impact of ostracism in childhood (Study 2).

Effects of Ostracism on Children's Moods and Needs Fulfillment

Consistent with the findings of Abrams et al. (2011) and Hawes et al. (2012, 2013), Study 1 and Study 2 showed that children's moods (anger, sadness, and happiness, but not anxiety) and fundamental needs (belonging, control, meaningful existence, and self-esteem) are strongly negatively affected when they are ostracized by a group of peers. These findings support the need-threat model by Williams (2009), and show that this model can be generalized to school age children. Since ostracism is a basic feature of group dynamics (Killen, Rutland, & Jampol, 2009) and human beings are evolutionary programmed to quickly detect signals of ostracism (Kerr & Levine, 2008), it is no surprise that children, like adults, respond strongly to the experience of ostracism.

Anxiety was the only outcome variable that was not significantly influenced by the ostracism experience in both studies. This result was somewhat surprising, since naturalistic studies suggest that children frequently experience anxiety as a result of negative social experiences such as exclusion and victimization (Flanagan, Erath, & Bierman, 2008; Hodges & Perry, 1999; Stapinski, Araya, Heron, Montgomery, & Stallard, 2015). In addition, Cyberball-induced ostracism has induced anxiety among adolescents in other experimental studies (e.g., Sebastian et al., 2010). It is possible, however, that anxiety (an anticipatory emotion involving the threat of upcoming danger) may be particularly sensitive to measurement timing. In one study of 4th and 5th graders, for example, children experienced a small peak in stress response (increased heart rate and decreased vagal tone) immediately following Cyberball exclusion, but a much larger peak in anticipation of playing a second round of the game with the same players (Hoff, Sandstrom, & Hane, 2011). Thus it may be an expectation of *ongoing* interaction with excluding members that especially drives higher levels of anxiety.

In future studies, it would be interesting to track participants' psychological distress throughout multiple rounds of the game in order to test this premise.

Varying the Severity of the Ostracism Experience

Our second goal was to examine the extent to which the number of excluders relative to the number of inclusive group members influences the negative impact of ostracism. In all of the previous Cyberball studies with children, all players acted in concert to exclude the participant. In everyday life, however, this is not necessarily the case. Children interact with their peers in many different configurations, and while some groups present a united front, others contain a mixture of accepting versus ostracizing classmates. Thus in Study 2, we varied the composition of the group such that children faced a range of experiences including complete ostracism (in which they were rejected by all three group members), moderate ostracism (in which they were excluded by two peers and included by one), minimal ostracism (in which they were excluded by one peer and included by two), and inclusion. We used these variations to compare different models for how ostracism might exert its adverse effect.

First, we predicted that children in the complete ostracism condition would report more negative impact across all moods and needs than children in any of the other experimental conditions. Indeed, the results support our premise that complete ostracism is more damaging than partial ostracism. It clearly feels worse (along multiple dimensions) to be excluded by everyone than to be excluded by only some group members. Or put another way, the presence of even a single ally is sufficient to lessen the psychological blow of ostracism. This finding is consistent with prior research showing that victims who felt that they had at least one peer who came to their defense reported better psychological and social adjustment than those who had no defenders (Hodges, Boivin, Vitaro, & Bukowski, 1999; Sainio et al., 2011).

What factors might explain why complete ostracism is perceived to be so painful? The simplest explanation may be that the additive effects of each partner's behavior accumulate to exact a heavy toll on targets' mood and need fulfillment. In other words, more ostracism is worse than less. Aside from incremental effects, however, it is also possible that there is something especially toxic about *unanimous* ostracism. From an evolutionary standpoint, unanimous exclusion from the group would have posed the greatest threat, since targets would stand the least chance of gaining access to resources. The presence of even one inclusive

member, however, could open the door to subsequent reintegration.

If unanimity is a necessary ingredient for psychological distress, we would expect a pattern in which children only report heightened distress in circumstances in which *all* group members exclude them. In contrast, we would expect no impact of ostracism in circumstances in which the ostracism is only partial. We found support for this model in one case. Children in the complete ostracism group reported higher levels of sadness than children in any other group, but children who were partially ostracized reported no greater sadness than children who were completely included. In contrast to sadness, partial ostracism *did* produce more negative outcomes than inclusion for happiness, anger, and need fulfillment. This suggests that while unanimity may play an important role in explaining the negative impact of ostracism on sadness, it is less likely to do so for other emotions or psychological needs. What is unique about sadness in this regard?

Sadness may be distinct from other emotional responses in that it is frequently accompanied by feelings of helplessness and hopelessness, rather than attempts to actively engage with the problem. For example, prior research found that children higher in depressive symptoms were more likely to engage in passive and avoidant coping behavior in response to an in vivo rejection experience (Reijntjes, Stegge, Terwogt, Kamphuis, & Telch, 2006). We speculate that when children are fully ostracized from a group and offered little reason to believe that the situation will change, sadness might be the most adaptive response. Indeed, feeling sad may encourage children to cut their losses so that they can invest their remaining emotional and physical energy into finding a more accepting group to join. When exclusion occurs in the context of supportive allies, however, it may be far more productive for children to remain positive, actively engaged, and optimistic. In other words, sadness may only kick in when group ostracism is at its most blatant in order to prevent children from prematurely withdrawing from mixed groups that have the potential to become more accommodating over time.

Next, we turned our attention to partial ostracism, and compared cases in which children experienced full inclusion, minimal ostracism, and moderate ostracism to each other. We were interested in determining whether children's distress in response to partial ostracism better fit an incremental or a consensual model. Results revealed strong support for the consensual model. Children in the minimal ostracism condition reported no greater deficits in mood and need fulfillment than children in the inclusion condition across all outcomes except self-esteem. In the case of anger, happiness,

sadness, anxiety, and all of the other psychological needs, the presence of one ostracizer in the context of two supportive peers had no impact. In the case of self-esteem, however, children in the minimal ostracism condition did report significantly lower levels than those who were fully included by their group mates. Thus self-esteem alone was susceptible to even the most minimal signals of ostracism.

Although it is not entirely clear why self-esteem is more sensitive to minimal ostracism than other moods and basic needs, Leary's (1999) *Sociometer Theory* provides one potential explanation. According to this model, self-esteem is an evolved mechanism designed to provide ongoing feedback about the acceptability of one's social behavior. It rises in response to positive feedback and falls in response to signals of disapproval, providing a continuous gauge of social success and a built-in warning system for social failure (Anthony, Wood, & Holmes, 2007; Leary, 2003). Thus dips in self-esteem are designed to protect people from continuing to behave in ways that could pose a serious threat to their fundamental need to belong. When working properly, low self-esteem triggers corrective behavior that acts to preserve a sense of belongingness. From an evolutionary standpoint, the ability to gauge even subtle signs of ostracism is adaptive because it allows greater opportunity for proactive corrective behavior. Self-esteem may be particularly sensitive to mild ostracism (even in those cases in which it occurs alongside more inclusive behavior) because it has evolved to detect even the most minor vacillations in social approval.

In contrast to the relative sensitivity of self-esteem, children's levels of happiness, need to belong, need for control, and need for meaningful existence conformed to a consensual model. Being confronted with a lone ostracizer did not diminish happiness and need fulfillment compared to inclusion. Children in the moderate ostracism group, *did*, however, report lower levels of happiness and need fulfillment than the fully included children, suggesting that the perception of consensual exclusion may be especially problematic for these outcomes. We suspect that a moderate level of ostracism provided the tipping point for negative effects on happiness and need fulfillment for two reasons. First, facing a pair of non-accepting peers (rather than just 1) flipped the power dynamic of the group such that there were more ostracizers than inclusive members present. Second, the kinds of attributions children make in response to coordinated acts of exclusion are likely to differ from those they make in response to solitary acts. While it may be possible to explain a lone excluder's behavior as idiosyncratic and peripheral, such external explanations may strain credibility as the number of ostracizers increases. Prior research has demonstrated

that internal attributions for social failure are associated with a host of negative outcomes including higher levels of depression and loneliness (Prinstein et al., 2005) and more negative cognitive appraisals of failure feedback (Reijntjes et al., 2008). Thus to the extent that consensual ostracism invites more personal blame for the exclusion, it may also lead to lower levels of happiness and need fulfillment.

LIMITATIONS AND FUTURE DIRECTIONS

These two experiments reveal the pervasive negative impact of ostracism on children, and also highlight the important role that supportive peers may play in ameliorating rejection experiences for socially vulnerable children. Across all outcomes, children who were excluded by all of the group members reported the lowest levels of well-being; when ostracism occurred in the presence of inclusive peers, however, negative effects were mitigated. Thus, the presence of inclusive members made a tangible difference in how target children experienced acts of ostracism.

Study 2 represents the first attempt to experimentally manipulate the number of excluding and inclusive group members in a child sample, and raises the intriguing possibility that the overall impact of group ostracism may not be determined solely by the additive effects of the individual excluders. Instead, our results reveal a more nuanced pattern. On one end of the continuum, children's self-esteem was particularly sensitive to even the mildest versions of group ostracism. On the other, sadness was robust to all forms of partial ostracism, and only increased in response to complete and unambiguous exclusion. For other moods and fundamental needs, children showed deficits in response to moderate, but not minimal forms of ostracism, suggesting that there might be something particular noxious about consensual acts of exclusion.

Despite the strengths of this pair of experiments, there are several limitations that should be addressed in future research on this topic. First, it is important to remember that this study examined ostracism in a *group* setting, and the results must be understood in that context. For example, although we found that children who faced a single excluder did not report lower levels of happiness or need fulfillment than fully included children, this result is qualified by the fact that the single excluder was accompanied by two inclusive group members. Solitary acts of ostracism that occur outside a group context (and presumably without the support of inclusive peers) are likely to have quite different effects. In future research, it will be important to compare the association between number of ostracizers and adjustment in both contexts.

Next, our manipulation of the Cyberball paradigm created certain constraints which deserve mention. Prior versions of Cyberball have routinely used 2–3 play partners. We chose to use three play partners in order to maximize our ability to vary the number of inclusive members present in the group. One problem with this set-up is that it confounds consensual and majority effects. That is, children in the moderate ostracism condition could report more negative outcomes because they face consensual ostracism, or simply because they face more excluding than inclusive members. In future studies, these competing explanations can be teased apart by including five play partners. If the negative impact of ostracism is driven by majority effects, we would expect a three-excluder condition to produce worse outcomes than a two-excluder condition; conversely, if the negative effect is driven by consensual rejection, we would expect no difference in outcomes between the two-excluder and three-excluder conditions.

Another limitation of the current design is that participants were not aware of the identity of their play partners. While they were all led to believe that they were interacting with three of their classmates, they did not know which ones. It is highly likely that the impact of rejection experiences is influenced by the identity of both the ostracizers and inclusive members. Being excluded or mistreated by friends may be especially painful (e.g., Crick & Nelson, 2002). By the same token, the buffering effects of inclusive others may be particularly potent when the allies are the target's friends rather than acquaintances. Future research should examine the impact of relationship type on children's reactions to excluding and inclusive peers in a group rejection experience.

Finally, the current project raised some interesting questions about the potential role of the attributions in shaping children's responses to group ostracism. We speculated that children who make internal attributions about their ostracism might experience greater decrements in mood and need fulfillment than children who are able to make external attributions. While prior research has demonstrated a general association between children's attributions about social failure and adjustment (e.g., Graham & Juvonen, 1998; Panak & Garber, 1992), the role of attributions within the Cyberball paradigm has not been directly assessed. In future research, it will be important to ask children to report on their attributions about being excluded during the Cyberball paradigm in order to determine how group composition and attributions for ostracism might interact to explain individual differences in children's responses to exclusion.

IMPLICATIONS FOR RESEARCH AND PRACTICE

First, this research highlights the heavy toll that group ostracism can take on young targets, and provides further support for the importance of monitoring and protecting children from these sorts of rejection experiences at school. Second, our results show that collective acts of ostracism are particularly negative experiences for children. Although prevention and intervention programs direct a great deal of attention toward discouraging children from initiating hurtful social dynamics, schools may also want to focus on discouraging children from joining the exclusionary actions of others. Children may feel less responsible for acts of ostracism when they do not perceive themselves as initiators, or when they are one of many children joining in the fray. Perhaps making children aware that exclusionary behavior carried out by a group has more detrimental consequences for the victim than the same behavior carried out by a single peer could help reduce the incidence of group ostracism. Further, reminding children that the presence of even one inclusive peer has the power to lessen the psychological blow of ostracism could empower them to be more active bystanders in the face of peer mistreatment.

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Appendix

Need Threat Scale for Children (NTS-C)

Needs were assessed on a 7-point scale, from 1 (not at all) to 7 (very much).

“During Cyberball...”

Belongingness

1. I felt like I belonged
2. I felt excluded (r)
3. I felt like the other players did not want me to participate in the game (r)
4. I felt like I did not belong in the group (r)
5. I felt alone (r)

Control

1. I felt in control during the game
2. I had the feeling I could throw as often as I wanted to the other players
3. I felt that I could change the course of the game
4. I felt that I was in charge of the game
5. I felt strong

Meaningful Existence

1. I felt like I did not exist (r)
2. I felt like I might as well not have participated (r)
3. I felt invisible (r)
4. I felt like it was important that I competed in the game
5. I felt that nobody would notice if I would leave the game (r)

Self-Esteem

1. I felt good about myself
2. I was worried about what the other players thought about me during the game (r)
3. I thought that I was as good as the other players
4. I felt like I played the game well
5. I felt like the other players liked me