


Explaining the Paradoxical Rejection–Aggression Link: The Mediating Effects of Hostile Intent Attributions, Anger, and Decreases in State Self-Esteem on Peer Rejection–Induced Aggression in Youth

Albert Reijntjes^{1,2}, Sander Thomaes¹, Jan H. Kamphuis², Brad J. Bushman^{3,4}, Bram Orobio de Castro¹, and Michael J. Telch⁵

Personality and Social Psychology Bulletin
37(7) 955–963
© 2011 by the Society for
Personality and Social Psychology, Inc
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0146167211410247
http://pspb.sagepub.com


Abstract

People are strongly motivated to feel accepted by others. Yet when faced with acute peer rejection they often aggress against the very peers they desire acceptance from, which may lead to further rejection. The present experiment tests three potential mediators of aggressive responses to acute peer rejection in the critical developmental stage of early adolescence. Participants ($N = 185$, $M_{\text{age}} = 11.5$ years) completed personal profiles that were allegedly evaluated online by peers. After receiving negative or neutral peer feedback, participants could aggress against the same peers who had evaluated them. Rejected participants attributed more hostile intent to the peers, were angrier, showed a greater reduction in state self-esteem, and were more aggressive. Mediation analyses showed that hostile intent attributions mediated the acute peer rejection–aggression relationship, whereas increases in anger and decreases in state self-esteem did not. Thus, acute peer rejection evokes hostile intent attributions that, in turn, lead to aggressive reactions.

Keywords

mediation, hostile intent attribution, aggression, anger, state self-esteem

Received September 9, 2010; revision accepted January 12, 2011

If a person offends you, and you are in doubt as to whether it was intentional or not, do not resort to extreme measures.

Mark Twain

Rejection and offenses come to everyone, often at the hands (or mouths) of peers. When rejection comes, some people seem to be able to brush it off easily. In contrast, other people lash out aggressively because they assume that the rejection was intentional. The tendency to assume that ambiguous provocations of others are actually hostile and intentional actions has been dubbed the “hostile attribution bias” (e.g., Dodge et al., 2003). Mark Twain warned about making attributions of hostile intent, and for good reason—hostile attributions often lead to aggressive interactions with others.

Hostile attributions provide one possible explanation of why peer rejection can sometimes lead to aggression in youth. However, there are other equally plausible explanations, including increases in angry feelings and decreases in state self-esteem. To shed light on why people aggress

against others who reject them, the present research evaluates these three possible mediators.

Explaining the Paradoxical Rejection–Aggression Link

People of all ages are strongly motivated to feel accepted and valued by others. In fact, this motivation is so strong that it has been labeled a need—“the need to belong” (Baumeister

¹Utrecht University, Utrecht, Netherlands

²University of Amsterdam, Amsterdam, Netherlands

³Ohio State University, Columbus, OH, USA

⁴VU University Amsterdam, Amsterdam, Netherlands

⁵University of Texas at Austin, Austin, TX, USA

Corresponding Author:

Albert Reijntjes, Utrecht University, Department of Psychosocial Development in Context, P.O. Box 80.140, 3584 CS, Utrecht, Netherlands
Email: a.h.a.reijntjes@uu.nl

& Leary, 1995). When children are excluded or rejected, it would seem most functional for them to try hard to regain acceptance and placate those who have rejected them. Instead, the opposite often occurs. Research shows that children who are enduringly rejected by their peers tend to become increasingly aggressive over time (e.g., Boivin, Vitaro, & Poulin, 2005; Dodge et al., 2003; McDougall, Hymel, Vaillancourt, & Mercer, 2001).

Longitudinal research suggests that the hostile attribution bias plays an important role in driving this effect. For instance, a prospective study among elementary school children found that children were increasingly likely to attribute hostile intent to peers over time as a consequence of sustained peer rejection (Dodge et al., 2003). That is, social rejection changes the way youth attend to social cues, by increasing their hypervigilance to hostile cues.

In research with children, the association between peer rejection and aggression is typically examined in the context of entrenched social relationships, comparing chronically rejected and nonrejected children. Although we know that children who are frequently rejected by peers also tend to be aggressive, the relationship between acute peer rejection and aggressive reactions has received relatively little attention. Common observation and recent empirical work indicate that incidents of acute peer rejection markedly increase children's propensity to aggress (e.g., Reijntjes et al., 2010; Sandstrom & Herlan, 2007). However, surprisingly little is known about why *acute* peer rejection increases aggression.

This seems unfortunate, especially because the mechanisms underlying aggressive reactions to instances of acute peer rejection may differ from the factors that maintain or exacerbate rejected status and aggressive behavior among children who have been chronically victimized by a particular peer group. Experiences of acute peer rejection (e.g., being ignored, being chosen last for a team, receiving negative peer feedback) are commonplace in childhood and adolescence (Asher, Rose, & Gabriel, 2001), and a better understanding of the psychological processes underlying aggression in response to these common experiences may improve prevention programs for reducing aggression.

Why might acute peer rejection lead to aggressive behavior? One possibility is that hostile intent attributions mediate this link. In the domain of peer provocation, a body of research has examined the link between hostile intent attributions to hypothetical provocation and the reported likelihood of subsequent aggressive reactions. Findings demonstrate that thoughts about why others act in presumably provocative ways have a powerful effect on the reported tendency to behave aggressively (e.g., Dodge, 1980; Dodge, Pettit, McClaskey, & Brown, 1986; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Moreover, research using peer provocation scenarios has shown that elicitation and priming of hostile intent attributions lead to aggressive responses (e.g., Dodge & Somberg, 1987). However, to date

there is no direct evidence that hostile intent attributions mediate the relationship between real-life acute peer rejection experiences and aggressive behavior. Moreover, alternative putative mediators have yet to be examined.

One likely candidate is anger. Attribution theorists (e.g., Weiner, 1985, 1986) have asserted that negative actions of others elicit anger when they are perceived as intentional, and this anger increases the likelihood of an aggressive response. Anger is the emotional concomitant of the propensity to aggress (e.g., Berkowitz, 1989), and reactive aggression has been described as an angry, defensive, retaliatory response to a perceived provocation.

Given that acute peer rejection reliably induces anger and angry children often behave in an aggressive manner (e.g., Hubbard et al., 2002), increases in anger may be another pathway through which acute peer rejection leads to aggression. Consistent with this argument, Graham, Hudley, and Williams (1992) showed that anger elicited by hypothetical provocations of same-age middle school peers perceived as malevolent increased the reported likelihood of behaving aggressively toward these peers. However, several studies in adults have failed to show that anger mediates the link between actual social rejection and aggression (e.g., Baumeister, Twenge, & Nuss, 2002). Hence, more research is needed on this topic.

There are also theoretical and empirical reasons to believe that children may aggress following acute peer rejection to try to repair their damaged self-esteem. Based on an interdisciplinary review of findings on violent and aggressive behavior, it has been asserted that a major cause of aggression is perceived threat to one's ego (Baumeister, Smart, & Boden, 1996). According to this view, people are prone to respond aggressively to the source of an external ego threat as an expression of the self's rejection of these self-esteem-threatening evaluations. Empirical evidence indicates that acute peer rejection produces strong decreases in state self-esteem (Thomaes et al., 2010), and decreases in self-esteem, in turn, predict increases in aggression (Baumeister et al., 1996). Viewed from this perspective, decreased state self-esteem is another route through which acute peer rejection may lead to aggression.

Overview of Present Study

Participants in the present study were rejected or not rejected by peers and were then given the chance to aggress against the peers who had evaluated them. Young adolescents were studied for two reasons. First, young adolescents attach great importance to the opinions and appraisals of peers and are greatly concerned about interpersonal acceptance (Hawley, Little, & Pasupathi, 2002), much more so than are younger children (Damon & Hart, 1988; Harter, 1999, 2006). Second, in this developmental stage, experiences of acute peer rejection are common (Asher et al., 2001; Storch & Ledley, 2005), and the frequency of severe aggressive and violent behaviors increases steeply (Dodge, Coie, & Lynam, 2006).

We measured three potential mediators of the link between acute peer rejection and aggression: hostile intent attribution toward the evaluating peers, increases in anger, and decreases in state self-esteem. These mediators are not necessarily competing or mutually exclusive and may jointly explain young adolescents' aggressive reactions to acute peer rejection. We used a single multiple mediation model to determine the relative magnitudes of the specific indirect effects associated with all mediators.

Method

Participants

Participants were 185 children (52% boys) in fifth and sixth grade classes from four public elementary schools in the Netherlands. Participants ranged in age from 10 to 13 years ($M = 11.5$ years, $SD = 9$ months), were primarily Caucasian (85%), and were predominantly from a middle-class SES background. Consent was obtained from parents (consent rate = 71%), and assent was obtained from children (assent rate = 97%). Participants received a small gift (e.g., mechanical pens) for their participation.

Procedure

Participants were tested individually in a quiet room at their school. Sessions lasted about 45 min. Children were told they would participate in an Internet popularity contest called "Survivor Game," which involved players being evaluated online by a panel of peer judges. In reality, the contest was controlled by a computer program. To add to the credibility and the attractiveness of the contest, an eye-catching logo of the American TV show *Survivor* appeared on the screen.

First, a photo was taken of the participant by a web cam connected to the laptop. Participants were told that their photo would be uploaded so that the peer judges could see it online. Next, baseline (Time 1) measures of state anger and state self-esteem were administered. State anger was assessed with a six-item scale similar to the Anger subscale of the Profile of Mood States (McNair, Lorr, & Droppleman, 1971). For all items (*angry, annoyed, furious, enraged, mad, irritated*), participants rated how they felt "right now, at the present time" on a 5-point scale (0 = *does not apply to me at all* to 4 = *applies perfectly to me*). Higher scores reflect higher levels of state anger (Cronbach's $\alpha = .71$). Boys and girls had similar baseline levels of anger, $t(183) = 0.14$, $p > .80$, $d = 0.02$.

State self-esteem was assessed using a psychometrically sound six-item scale that has been used successfully in previous research (Thomaes et al., 2010). The state self-esteem scale is modeled after widely used trait self-esteem scales (e.g., Harter, 1985; Rosenberg, 1979), but participants indicate how they feel "right now, at the present time." The scale

contains both positive (e.g., "I feel good about who I am right now") and negative items (e.g., "I am dissatisfied with myself right now"). Items were scored on a 5-point scale (0 = *not at all* to 4 = *very much*). The negative items were reverse scored, and then all items were summed (Cronbach's $\alpha = .72$). Higher scores reflected higher levels of state self-esteem. Boys reported higher baseline state self-esteem than did girls, $M = 19.68$, $SD = 2.81$ and $M = 18.63$, $SD = 2.76$, respectively, $t(183) = 2.57$, $p < .05$, $d = 0.38$.

Participants were told that the other players and peer judges were of the same age but from different schools. To help the judges get to know them better, participants answered online several questions about themselves (e.g., their favorite musical group, things they liked and disliked about themselves, their personality traits). After a brief waiting period, participants were told they would have 5 min to look over the feedback from the judges. Participants saw photos of eight judges (four boys, four girls). By clicking on a photo, participants could see the judge's profile (i.e., name, age, residence) along with the judge's feedback about them. The feedback of each judge consisted of four evaluative statements that were presented in a short narrative.

Participants were randomly assigned to one of two peer feedback conditions. In the negative rejection condition, three statements were negative (e.g., "I would not like to be friends with this person"; "I don't think I would enjoy hanging out with him"; "I am not interested in the kind of things she likes") and one was neutral (e.g., "I think this girl likes reading a lot"). In the nonrejection (control) condition, all statements were neutral. Participants could move back and forth between judges by clicking on their photos.

After reading their feedback, participants completed the state anger and state self-esteem measures again (Time 2). As a rationale for completing the scales again, participants were told that measures would be given at several time points during the contest because the designers of *Survivor* were curious to know how children would respond to positive or negative feedback from peers.

Next, participants completed a four-item scale that measured the extent to which they attributed hostile intent toward the peer judges in providing their feedback (i.e., "It was the intention of the judges to hurt me"; "The judges intentionally made up bad things about me"; "The judges made an effort to describe me as I really am"; "The judges tried to be honest and sincere in providing their feedback"). Items were scored on a 5-point scale (0 = *completely agree* to 4 = *completely disagree*). The second and third items were reverse scored, and then all items were summed (Cronbach's $\alpha = .85$). Higher total scores reflected higher levels of hostile intent attribution.

Participants were then given the opportunity to aggress in two different ways against four peer judges (two boys, two girls) who had evaluated them. First, they could allegedly influence the amount of money each judge would receive for participating in the study. The default fee was €2 (\$3).

Participants could leave this amount unchanged, subtract €1 or €2, or add €1 or €2. Second, participants could post comments about the judges (next to their photos) on the (bogus) popular *Survivor* website, which was said to receive a lot of hits. Two independent coders rated whether comments were exclusively aggressive (e.g., “This person looks fat and seems dull”; score = 1) or not (“This girl doesn’t seem very smart to me, but I think she is witty”; score = 0; $\kappa = .90$). For both aggression measures, scores were summed across the four peer judges to yield total scores for financial aggression and verbal aggression, respectively.

Finally, participants were fully debriefed. During the debriefing, participants were told that the judges, the coplayers, and the feedback they received were bogus. They were also informed about the true purpose of the study and the need for deception. They were assured that their responses were completely confidential. To reduce any potential lingering effect of negative feedback, participants were interviewed at length about a recent positive social experience. Research has shown that these debriefing procedures are effective for early adolescents (Hurley & Underwood, 2002). Previous work has shown that participants are positive about participation in *Survivor* and report no objections about the deception or the procedures (e.g., Reijntjes, Stegge, Meerum Terwogt, Kamphuis, & Telch, 2006). During the debriefing, no participant expressed suspicion about the study, and no participant guessed what the study was about when explicitly asked.

Results

Random Assignment Manipulation Check

A MANOVA revealed that age, state anger, and state self-esteem at baseline did not differ between the two peer feedback conditions ($ps > .50$), indicating that random assignment to conditions was effective (see Table 1).

Effects of Acute Peer Rejection on Hostile Intent Attribution, Changes in State Anger, and Changes in State Self-Esteem

A 2 (rejection vs. no rejection) \times 2 (participant gender) ANOVA revealed that children attributed more hostile intent to the negative rejecting feedback than they did to the neutral feedback, $F(1, 181) = 185.61, p < .001, d = 2.18$ (see Table 1). No main or interactive effects for gender emerged.

Next, a 2 (rejection vs. no rejection) \times 2 (participant gender) \times 2 (pre- vs. postfeedback measurement time) MANOVA with repeated measures on the last factor was conducted, with state anger and state self-esteem serving as dependent variables. Results revealed a main effect for time and a significant interaction between time and rejection, $F(2, 180) = 19.59$ and 28.26, respectively, $ps < .001$ (see Table 1).

Table 1. Means and Standard Deviations of Age, State Anger, State Self-Esteem, Perceived Hostility of Intent and Aggression Measures by Condition

Measure	Feedback condition			
	Neutral ($n = 89$)		Failure ($n = 96$)	
	M	SD	M	SD
Age (months)	139.7	8.23	138.2	8.22
State self-esteem T1	25.22	3.19	25.15	2.49
State self-esteem T2	25.32	3.39	22.16	4.48
State anger T1	7.18	1.96	7.30	1.71
State anger T2	6.85	1.40	9.52	3.79
Perceived hostility of intent	1.61	1.84	7.79	3.82
Verbal aggression ^a	0.05	0.21	0.93	1.18
Financial aggression ^b	-1.02	2.22	1.89	1.86

^aFor each of the four judges, participants’ comments are dichotomously scored (1 = aggression, 0 = no aggression). Total scores are summed and can range from 0 to 4; higher scores indicate higher levels of verbal aggression.

^bParticipants can increase or decrease the default financial reward for each of the four judges with one or two Euros. Increasing the financial reward is scored negatively (-1 or -2). Decreasing the financial reward is scored positively (1 or 2). Total scores are obtained by summing these scores across judges. Higher total scores connote higher levels of financial aggression.

Univariate follow-up analyses showed that the multivariate interaction between time and rejection was significant for both changes in state anger and changes in state self-esteem, $F(1, 181) = 37.84$ and 41.23, respectively, $ps < .001$. Follow-up simple effects revealed that children randomized to the rejection condition on average experienced a significant increase in state anger, and a significant decrease in state self-esteem, $F(1, 95) = 35.34$ and 49.37, $p < .001, ds = 0.81$ and 0.86, respectively (see Table 1). Nonrejected participants experienced a modest but significant decrease in state anger but no significant change in state self-esteem, $F(1, 88) = 5.49, p < .05, d = 0.20$, and $F(1, 88) = 0.55, p > .30$, respectively. No main or interactive effects for gender emerged.

Effects of Acute Peer Rejection on Aggression

A 2 (rejection vs. no rejection) \times 2 (participant gender) MANOVA with the two aggression measures serving as dependent variables showed that children provided with negative peer feedback responded more aggressively than did controls, $F(2, 180) = 56.23, p < .001$. Subsequent univariate ANOVAs showed that rejected children subtracted more money from judges and posted more negative comments about them on the *Survivor* website than did nonrejected children, $F(1, 181) = 89.36$ and 46.12, respectively, $p < .001, d = 1.43$ and 1.24, respectively (see Table 1). No main or interactive effects for gender emerged.

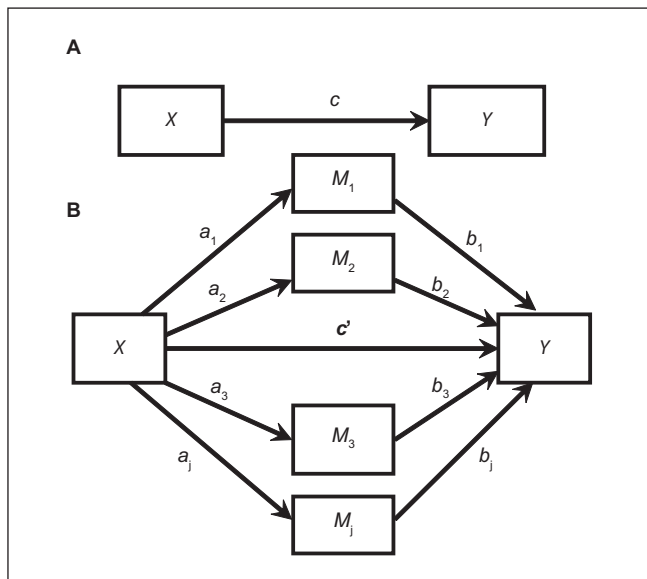


Figure 1. Illustration of a multiple mediation design with *J* mediators.

Consistent with meta-analytic findings showing that different measures of aggression tap the same underlying construct (Carlson, Marcus-Newhall, & Miller, 1989), the two aggression indices (financial and verbal) were significantly positively correlated ($r = .42, p < .001$) and showed a similar pattern of results. The two indices were therefore standardized and summed to form a composite aggression measure for the mediational analyses reported below.¹

Are the Effects of Acute Peer Rejection on Aggression Mediated by Hostile Intent Attributions, Changes in Anger, or Changes in State Self-Esteem?

In Figure 1, a multiple mediation model with *j* mediators is displayed. The total effect of X on Y is represented by Path *c* in Figure 1a. Figure 1b represents both the direct effect of X on Y (Path *c'*) and the indirect effects of X on Y via the *j* mediators. The specific indirect effect of X on Y via Mediator *i* (Brown, 1997; Fox, 1985) is defined as the product of the two paths linking X to Y via that mediator. For instance, the specific indirect effect of X on Y through *M*₁ is calculated as $a_1 * b_1$. Including several putative mediators in a single multiple mediation model allows one to determine which mediators are most important. Importantly, a specific indirect effect through a mediator (say *M*₂) in the multiple mediation context does not equal the indirect effect through *M*₂ alone, unless all other mediators are uncorrelated to *M*₂ (the correlations between the three putative mediators and aggressive reactions are shown in Table 2).

To assess the total and specific indirect effects for the three putative mediators, the bootstrapping procedure for

Table 2. Zero-Order Intercorrelations Between Putative Mediators and Aggression by Condition

Variable	1	2	3	4
1. Change in anger from Time 1 to Time 2	—	-.41**	.41**	.11
2. Change in state self-esteem from Time 1 to Time 2	-.07	—	-.18	.02
3. Hostile intent attribution	.05	-.23*	—	.34**
4. Aggression	.05	.13	.12	—

Figures above the diagonal pertain to the negative, rejection feedback condition, figures below the diagonal pertain to the nonrejection (control) condition.

* $p < .05$. ** $p < .01$.

multiple mediators was used (see Preacher & Hayes, 2008). This procedure addresses the problem that the paths that constitute the indirect effects rarely follow a multivariate normal distribution, and it provides the most powerful and reasonable method to obtain point estimates and confidence intervals for specific indirect effects. In the present analysis, the number of bootstrap resamples was 5,000. We used the bias-corrected and accelerated confidence interval, which is the most stringent test for mediation (e.g., Briggs, 2006; Williams & MacKinnon, 2008).

The results of the mediational analyses are shown in Table 3. The findings show that, taken as a set, hostile intent attributions, changes in anger, and changes in state self-esteem mediate the effect of the feedback manipulation on subsequent aggression. The total and direct effects of the feedback manipulation on aggression are 2.076 ($p < .001$) and 1.369 ($p < .001$), respectively. The difference between the total and direct effects is the total indirect effect through the three mediators, with a point estimate of 0.706 (95% bias-corrected and accelerated bootstrap CI = 0.316 to 1.196). Because the confidence interval excludes the value 0, the difference between the total and direct effects of the rejection manipulation on aggression is significant.

The specific indirect effects reveal that only hostile intent attribution is a significant mediator because it is the only confidence interval that excludes the value 0. Neither changes in state self-esteem nor changes in anger contribute to the indirect effect above and beyond hostile intent attribution, which indicates mediation specificity.

We considered it important to also examine the possibility that anger and self-esteem mediate the relation between acute peer rejection and aggression, but not as strongly as hostile attributions. To that end, separate mediation analyses were performed (see Kraemer, Wilson, Fairburn, & Agras, 2002). Changes in state anger did not mediate the effect of acute peer rejection on aggression because neither changes in state anger nor the interaction between the feedback manipulation and changes in state anger were associated with aggression. This finding indicates no partial or complete mediation. For the same reason, changes in state

Table 3. Mediation of the Effect of Acute Peer Rejection on Aggression Through Hostile Intent Attribution, Increases in Anger, and Decreases in State Self-Esteem

Mediating variables	Total effect	Direct effect	Total indirect effect	Path between rejection and mediator	Path between mediator and aggression	Specific indirect effects	Bias-corrected and accelerated 95% CI	
							Lower	Upper
	2.076**	1.369**	0.706**				0.316	1.196
Hostile intent attribution				1.424**	0.525**	0.748**	0.304	1.316
Change in state self-esteem				-0.860**	0.208*	-0.179	-0.400	0.001
Change in state anger				0.832**	0.169	0.141	-0.073	0.355

* $p < .10$. ** $p < .05$.

self-esteem did not mediate the effect of acute peer rejection on aggression.

In contrast, results showed that the main effect of hostile intent attribution on aggressive responding was significant after controlling for feedback condition, $F(1,182) = 16.99$, $\beta = .34$, $p < .001$. No significant interaction effect between condition and hostile intent attribution was observed ($p > .20$). These findings indicate significant mediation. The Sobel (1982) test of the indirect effect of acute peer rejection on aggression was also significant, $z = 3.38$, $p < .001$. The link between acute peer rejection and aggression became weaker after controlling for hostile intent attribution but was still significant, $\beta = .62$, $p < .01$, and $\beta = .38$, $p < .01$, respectively.

Discussion

The present study is the first to investigate mechanisms governing the link between acute peer rejection in real time and retaliatory aggression in youth. Negative rejecting peer feedback led to high aggression levels against the peer judges who had delivered the negative feedback. Although the rejection experience exerted strong effects on each of the three examined putative mediators, our findings reveal mediational specificity by demonstrating that only hostile intent attributions mediated the link between acute peer rejection and subsequent aggression.

The observation that hostile intent attributions constitute the critical link between an instance of peer rejection and subsequent aggressive responding is consistent with recent research in adults showing that actual social rejection activates a hostile cognitive bias, which in turn predicts subsequent aggressive responses (DeWall, Twenge, Gitter, & Baumeister, 2009). However, whereas previous research demonstrated that generalized hostile cognitions (people's tendency to think in hostile ways about others) lead to the aggressive treatment of others who were not involved in the

rejection experience (i.e., displaced aggression), the present research indicates that hostile intent attributions toward the rejecting peers governed direct (retaliatory) aggression against these same peers.

The important role of hostile intent attributions in shaping aggressive responses to acute social rejection is also stressed in the multimotive model of reactions to interpersonal rejection (Smart Richman & Leary, 2009). According to this theory, although the immediate reactions to social rejection experiences are negative affect and lowered state self-esteem, the cognitive construal of the rejection event is most influential in determining the subsequent behavioral response. In the immediate aftermath of a social rejection experience, people simultaneously experience competing motives, including regaining acceptance, hurting the person who rejected them, and avoiding further social contact with the person delivering the rejection. The theory proposes that aggression will predominate when the rejection is perceived as hostile and unfair, especially when the relationship is not highly valued and expectations of repairing the relationship are low.

Although numerous studies have demonstrated a linkage between hostile intent attributions and reactive aggression in youth, most of this research was conducted with children nominated as aggressive by peers (e.g., Dodge & Somberg, 1987) or youth incarcerated for criminal offenses (e.g., Dodge, Price, Bachorowski, & Newman, 1990). It has already been established that children with hostile attributional biases tend to retaliate in response to ambiguous provocation events. These biases appear to originate from chronic peer rejection or victimization, early harsh and abusive parenting, and a temperamental disposition toward anxiety, angry reactivity, and deficient emotion regulation (e.g., Dodge, Lochman, Harnish, Bates, & Pettit, 1997; Weiss, Dodge, Bates, & Pettit, 1992). Moreover, the relation between hostile intent attributions and social maladjustment (e.g., rejection) is quite robust (Crick & Dodge, 1994). This study extends previous studies by showing that hostile intent attributions

assessed in a community sample not merely covary with but also mediate interpersonally aggressive reactions to acute peer rejection in real time.

Our findings provide no empirical support for the hypotheses that either changes in anger or changes in state self-esteem mediate the link between acute peer rejection and aggression. Although rejection yielded pronounced increases in anger and decreases in state self-esteem, results show that these responses did not increase subsequent aggression. Hence, two of the three plausible putative mediators did not play a role in the link between acute peer rejection and aggression. The null findings for anger in the present sample of youth suggest that hostile intent attributions instigate aggressive behavior without the mediating influence of anger, which is consistent with theories proposing that anger and aggression are parallel processes (Berkowitz, 1983). This finding is at odds with previous research that used hypothetical peer provocation scenarios (Graham et al., 1992), but it is in line with several studies in adults showing that negative emotional reactions do not mediate the linkage between actual social rejection experiences and subsequent aggressive responses (e.g., Twenge & Campbell, 2003). This discrepancy between study findings is consistent with previous work showing that anticipated responses to hypothetical emotion-eliciting events often differ from online obtained responses to these events (e.g., Robinson & Clore, 2002).

Several features of the current study deserve further comment. With regard to external validity, we acknowledge that laboratory aggression measures share few surface features with real-world physical aggression. However, these aggression measures do share the core conceptual features of delivering a noxious stimulus to a victim with the intent and expectation of harming the victim. Moreover, it has been demonstrated that laboratory and real-world aggression measures are influenced in similar ways by situational variables (e.g., provocation, alcohol intoxication, violent media) and individual difference variables (e.g., trait aggressiveness, Type A personality, gender; Anderson & Bushman, 1997). Second, our findings revealed that hostile intent attributions only partially mediated the effects of acute peer rejection on subsequent aggression. Hence, future studies are needed to identify other potential mediators. Some possibilities include rejection leading to weakened social inhibitions to aggress and rejection leading to lowered self-control (see Leary, Twenge, & Quinlivan, 2006, for a review). Third, whereas the social information processes and potential cognitive distortions activated in response to online peer rejection are likely highly automated, participants completed a hostile intent measure that required conscious thought to tap these processes. We cannot rule out the possibility that processing patterns assessed in conscious, formal ways are not identical to automatic, rapid, "preemptive" processing patterns (Crick & Dodge, 1994) that occur "without thinking." Noteworthy, in a study comparing the processing of social information of

rejected boys under reflective versus automatic conditions, information was processed in a more distorted fashion under automatic conditions (Rabiner, Lenhart, & Lochman, 1990). Hence, the reflective measure used in the present research may have underestimated the magnitude and effects of the actually experienced hostile intent attribution bias. Nevertheless, an important challenge for future research is to use measures that enable the assessment of automatic cognitive processes.

The present study is not without limitations. First, participants were rejected by unfamiliar peers rather than by significant others. Clearly, reactions to rejection from close friends or family members may differ from those elicited by rejections from strangers. For instance, prosocial responses to rejection may be more likely when the relationship is highly valued by the rejected individual and expectations of relational repair are high (Smart Richman & Leary, 2009). However, during the past two decades, online communications with unfamiliar peers have become an integral part of young adolescents' daily life, and cyber aggression is a mounting problem in today's society (Smith et al., 2008). Second, our findings are based on a community sample of young adolescents consisting of primarily middle-class Caucasians. Future research should examine clinical samples and include children from different ethnic groups as well as children from younger and older age groups. Third, the putative mediators in this study were measured rather than manipulated. Consequently, the test of mediation is correlational, not experimental.

Notwithstanding these limitations, this is the first study examining potential mediators of the link between acute peer rejection and aggression in youth. The present findings shed light on why youth are likely to respond aggressively when faced with acute peer rejection. Contrary to the view that damaged self-esteem or increases in anger mediate this link, our findings show that hostile intent attributions better account for why youth aggress in response to acute peer rejection. Youth feel bad after being rejected, but these bad feelings do not necessarily lead to aggression. But if youth think the rejection was provided with hostile intentions, they are likely to "resort to extreme measures" (to use the words of Mark Twain) and lash out aggressively against those who rejected them.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Note

1. We also performed mediational analyses for both aggression measures separately. Results were identical.

References

- Anderson, C. A., & Bushman, B. J. (1997). External validity of "trivial" experiments: The case of laboratory aggression. *Review of General Psychology, 1*, 19-41.
- Asher, S. R., Rose, A. J., & Gabriel, S. W. (2001). Peer rejection in everyday life. In M. Leary (Ed.), *Interpersonal rejection* (pp. 105-142). New York, NY: Oxford University Press.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.
- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Review, 103*, 5-33.
- Baumeister, R. F., Twenge, J. M., & Nuss, C. K. (2002). Effects of social exclusion on cognitive processes: Anticipated aloneness reduces intelligent thought. *Journal of Personality and Social Psychology, 83*, 817-827.
- Berkowitz, L. (1983). The experience of anger as a parallel process in the display of impulsive, "angry" aggression. In R. G. Geen & E. I. Donnerstein (Eds.), *Aggression: Theoretical and empirical reviews* (pp. 103-133). New York, NY: Academic Press.
- Berkowitz, L. (1989). Frustration-aggression hypothesis: Examination and reformulation. *Psychological Bulletin, 106*, 59-73.
- Boivin, M., Vitaro, F., & Poulin, F. (2005). Peer relationships and the development of aggressive behavior in early childhood. In R. E. Tremblay, W. W. Hartup, & J. Archer (Eds.), *Developmental origins of aggression* (pp. 376-397). New York, NY: Guilford.
- Briggs, N. (2006). Estimation of the standard error and confidence intervals of the indirect effect in multiple mediator models. *Dissertation Abstracts International, 37*, 4755B.
- Brown, R. L. (1997). Assessing specific mediational effects in complex theoretical models. *Structural Equation Modeling, 4*, 142-156.
- Carlson, M., Marcus-Newhall, A., & Miller, N. (1989). Evidence for a general construct of aggression. *Personality and Social Psychology Bulletin, 15*, 377-389.
- Crick, N. C., & Dodge, K. A. (1994). A review and reformulation of social information processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*, 74-101.
- Damon, W., & Hart, D. (1988). *Self-understanding in childhood and adolescence*. New York, NY: Cambridge University Press.
- DeWall, C. N., Twenge, J. M., Gitter, S. A., & Baumeister, R. F. (2009). It's the thought that counts: The role of hostile cognition in shaping aggressive responses to social exclusion. *Journal of Personality and Social Psychology, 96*, 45-59.
- Dodge, K. A. (1980). Social cognition and children's aggressive behavior. *Child Development, 51*, 162-170.
- Dodge, K. A., Coie, J. D., & Lynam, D. (2006). Aggression and antisocial behavior in youth. In W. Damon & R. M. Lerner (Series Eds.), N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (pp. 719-788). New York, NY: John Wiley.
- Dodge, K. A., Landsford, J. E., Salzer Burks, V., Bates, J. E., Pettit, G. S., Fontaine, R., & Price, J. M. (2003). Peer rejection and social-information processing factors in the development of aggressive behavior problems in children. *Child Development, 74*, 374-393.
- Dodge, K. A., Lochman, J. E., Harnish, J. D., Bates, J. E., & Pettit, G. S. (1997). Reactive and proactive aggression in school children and psychiatrically impaired chronically assaultive youth. *Journal of Abnormal Psychology, 106*, 37-51.
- Dodge, K. A., Pettit, G. S., McClaskey, C. L., & Brown, M. M. (1986). Social competence in children. *Monographs of the Society for Research in Child Development, 51*.
- Dodge, K. A., Price, J. M., Bachorowski, J. A., & Newman, J. P. (1990). Hostile attributional biases in severely aggressive adolescents. *Journal of Abnormal Psychology, 99*, 385-392.
- Dodge, K. A., & Somberg, D. R. (1987). Hostile attribution biases among aggressive boys are exacerbated under conditions of threat to the self. *Child Development, 58*, 213-224.
- Fox, J. (1985). Effects analysis in structural equation modeling II: Calculation of specific indirect effects. *Sociological Methods & Research, 14*, 81-95.
- Graham, S., Hudley, C., & Williams, E. (1992). Attributions of aggressive and nonaggressive African-American and Latino young adolescents. *Developmental Psychology, 28*, 731-740.
- Harter, S. (1985). *The self-perception profile for children: Revision of the Perceived Competence Scale for Children* (Manual). Denver, CO: University of Denver.
- Harter, S. (1999). *The construction of the self: A developmental perspective*. New York, NY: Guilford.
- Harter, S. (2006). The self. In W. Damon & R. M. Lerner (Series Eds.), N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (pp. 505-570). New York, NY: John Wiley.
- Hawley, P. H., Little, T. D., & Pasupathi, M. (2002). Winning friends and influencing peers: Strategies of peer influence in late childhood. *International Journal of Behavioral Development, 26*, 466-473.
- Hubbard, J. A., Smithmyer, C. M., Ramsden, S. R., Parker, E. H., Flanagan, K. D., Dearing, K. F., . . . Simons, R. F. (2002). Observational, physiological, and self-report measures of children's anger: Relations to reactive versus proactive aggression. *Child Development, 73*, 1101-1118.
- Hurley, J. C., & Underwood, M. K. (2002). Children's understanding of their research rights before and after debriefing: Informed assent, confidentiality, and stopping participation. *Child Development, 73*, 132-143.
- Kraemer, H. C., Wilson, G. T., Fairburn, C. G., & Agras, W. S. (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry, 59*, 877-883.
- Leary, M. R., Twenge, J. M., & Quinlivan, E. (2006). Interpersonal rejection as a determinant of anger and aggression. *Personality and Social Psychology Review, 10*, 111-132.
- McDougall, P., Hymel, S., Vaillancourt, T., & Mercer, L. (2001). The consequences of childhood peer rejection. In M. Leary

- (Ed.), *Interpersonal rejection* (pp. 213-247). New York, NY: Oxford University Press.
- McNair, D., Lorr, M., & Droppleman, L. (1971). *ETS manual for the Profile of Mood States*. San Diego, CA: Educational and Industrial Testing Service.
- Orobio de Castro, B., Veerman, J. W., Koops, W., Bosch, J. D., & Monshouwer, H. J. (2002). Hostile attribution of intent and aggressive behavior: A meta-analysis. *Child Development, 73*, 916-934.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891.
- Rabiner, D. L., Lenhart, L., & Lochman, J. E. (1990). Automatic versus reflective social problem solving in relation to children's sociometric status. *Developmental Psychology, 26*, 2010-2016.
- Reijntjes, A., Stegge, H., Meerum Terwogt, M., Kamphuis, J. H., & Telch, M. J. (2006). Children's coping with in vivo peer rejection: An experimental investigation. *Journal of Abnormal Child Psychology, 34*, 877-889.
- Reijntjes, A., Thomaes, S., Bushman, B. J., Boelen, P. A., Orobio de Castro, B., & Telch, M. J. (2010). The outcast-lash-out effect in youth: Alienation increases aggression following peer rejection. *Psychological Science, 21*, 1394-1398.
- Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: evidence for an accessibility model of emotional self-report. *Psychological Bulletin, 128*, 934-960.
- Rosenberg, M. (1979). *Conceiving the self*. New York, NY: Basic Books.
- Sandstrom, M. J., & Herlan, M. D. (2007). Threatened egotism or confirmed inadequacy? How children's perceptions of social status influence aggressive behaviour toward peers. *Journal of Social and Clinical Psychology, 26*, 240-267.
- Smart Richman, L., & Leary, M. R. (2009). Reactions to discrimination, stigmatization, ostracism, and other forms of interpersonal rejection: A multimotive model. *Psychological Review, 116*, 365-383.
- Smith, P. K., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: Its nature and impact in secondary school pupils. *Journal of Child Psychology and Psychiatry, 49*, 376-385.
- Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290-312). San Francisco, CA: Jossey-Bass.
- Storch, E. A., & Ledley, D. R. (2005). Peer victimization and psychosocial adjustment in children: Current knowledge and future directions. *Clinical Pediatrics, 44*, 29-38.
- Thomaes, S., Reijntjes, A., de Castro, B. O., Bushman, B. J., Poorthuis, A., & Telch, M. J. (2010). I like me if you like me: On the interpersonal modulation and regulation of preadolescents' state self-esteem. *Child Development, 81*, 811-825.
- Twenge, J. M., & Campbell, W. K. (2003). "Isn't it fun to get the respect that we're going to deserve?" Narcissism, social rejection, and aggression. *Personality and Social Psychology Bulletin, 29*, 261-272.
- Weiner, B. (1985). "Spontaneous" causal thinking. *Psychological Bulletin, 97*, 74-84.
- Weiner, B. (1986). *An attributional theory of motivation and emotion*. New York, NY: Springer-Verlag.
- Weiss, B., Dodge, K. A., Bates, J. E., & Pettit, G. S. (1992). Some consequences of early harsh discipline: Child aggression and a maladaptive information processing style. *Child Development, 63*, 1321-1335.
- Williams, J., & MacKinnon, D. P. (2008). Resampling and distribution of the product methods for testing indirect effects in complex models. *Structural Equation Modeling, 15*, 23-51.