

Hostile Intent Attributions and Relational Aggression: The Moderating Roles of Emotional Sensitivity, Gender, and Victimization

Lindsay C. Mathieson · Dianna Murray-Close · Nicki R. Crick · Kathleen E. Woods · Melanie Zimmer-Gembeck · Tasha C. Geiger · Julie R. Morales

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Abstract The current study adopts a relational vulnerability model to examine the association between hostile attribution bias and relational aggression. Specifically, the relational vulnerability model implicates the interactive effects of a number of relational risk factors in the development of relational aggression. A sample of 635 3rd, 4th, and 5th grade students (50.2% females) completed

a self-report measure assessing hostile attribution bias and emotional distress for relational provocations. Peer nominations and teacher reports of relational aggression and relational victimization were also collected. Results supported the relational vulnerability model for girls only. Specifically, hostile attribution bias was associated with relational aggression only when relational victimization and emotional distress were also high. Implications for future research and clinical practice are discussed.

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Keywords Hostile attribution biases · Aggression · Gender · Victimization

L. C. Mathieson (✉) · N. R. Crick
Institute of Child Development, University of Minnesota,
51 East River Rd,
Minneapolis, MN 55455, USA
e-mail: mathi137@umn.edu

D. Murray-Close
Department of Psychology, University of Vermont,
Burlington, VT, USA

K. E. Woods
St. Paul Children's Hospital,
St. Paul, MN, USA

M. Zimmer-Gembeck
School of Psychology and Griffith Health Institute,
Griffith University,
Gold Coast, Australia

T. C. Geiger
Bluegrass Regional Mental Health-Mental Retardation Board,
Lexington, KY, USA

J. R. Morales
Butler Institute for Families, University of Denver,
Denver, CO, USA

Peer aggression is an important problem facing children and adolescents today. Historically, researchers have focused on studying physical aggression, primarily in boys (Crick and Grotpeter 1995). However, in the last few decades, researchers have begun to examine the causes and correlates of relational forms of aggression (Crick et al. 2007). Relational aggression occurs when the relationship is used as the vehicle of harm and includes acts such as spreading rumors, excluding another from a group/activity, and ignoring another (Crick and Grotpeter 1995). Prior studies have demonstrated that after controlling for physical aggression, relational aggression is associated with a variety of adjustment difficulties, such as internalizing problems (Card et al. 2008; Murray-Close et al. 2007), externalizing problems (Crick et al. 2006; Prinstein et al. 2001), peer rejection (Crick 1996), loneliness (Crick and Grotpeter 1995), and borderline personality features (Crick et al. 2005). Moreover, although girls exhibit lower levels of physical aggression than their male counterparts, they are as likely as boys (if not more likely) to engage in relational forms of aggression (e.g., Card et al. 2008). Given the negative outcomes associated with both perpetrating and

being targeted by relational aggression, and given research suggesting that both males and females tend to engage in relational forms of aggression with some frequency, it is important that researchers develop a better understanding of the processes that place children at risk for relationally aggressive conduct.

Social information processing (SIP) has been explored as a potential social-cognitive mechanism involved in children's engagement in aggression. Crick and Dodge (1994) proposed six steps of SIP: encoding of cues, interpretation of cues, clarification of goals, response access or construction, response decision, and behavioral enactment. Although previous research has implicated SIP deficits at each step in children's aggressive conduct (Crick and Dodge 1994), the majority of work in this area has focused on step 2: interpretation of cues. Specifically, researchers have demonstrated that children with a hostile attribution bias (HAB), defined as the attribution of hostile intent in an ambiguous social situation, are at an elevated risk for involvement in aggressive conduct (e.g., Crick and Dodge 1994; Dodge 1980; Orobio de Castro et al. 2002). However, an important limitation of research in this area is the focus on the association between HAB in response to instrumental provocations (e.g., a child is bumped from behind in the hallway at school) and physical forms of aggression. With the growing literature on relational aggression, researchers have begun to address this limitation by examining whether HAB is a risk factor for children's involvement in relational aggression.

Relational Aggression and Hostile Attribution Bias

Crick (1995) theorized that HAB may serve as a risk factor for children's involvement in relational aggression. However, given their focus on interpersonal relationships, relationally aggressive children were hypothesized to show HAB and emotional distress in response to perceived relational provocations (e.g., not getting invited to a party; Crick 1995). Ostrov and Godleski (2010) proposed a revision of this theoretical model, integrating gender schema theory with models of SIP. From this perspective, children's gender schemas are hypothesized to have a direct effect on their tendencies to exhibit HAB, such that behaviors will be more readily remembered and incorporated into SIP (including future interpretation of social cues) when they are relevant to children's past experiences and gender schemas. For example, given the gender relevance of relational slights (Cross and Madsen 1997), girls are hypothesized to be more likely than boys to view relational provocations as distressing and to interpret ambiguous relational situations as hostile. Given these theoretical propositions, one would expect research to show

that (a) relationally aggressive children demonstrate HAB for relational provocations and (b) girls find relational provocations more distressing than boys. Whereas the majority of the research supports the latter point (Coyne et al. 2006; Crick 1995; Crick et al. 1996; Crick et al. 2002; Galen and Underwood 1997; Giles and Heyman 2005; Goldstein et al. 2002; Paquette and Underwood 1999), research has been somewhat mixed with respect to the first point.

Some research has provided support for the notion that relationally aggressive children show HAB for relational provocations. For example, in a sample of 3rd through 6th graders, Crick (1995) found that relationally aggressive children showed HAB and heightened levels of distress for relational provocations. Similarly, Crick et al. (2002) conducted two studies with samples of elementary school-aged children. They found that relationally aggressive children showed more hostile attributions and emotional distress in response to hypothetical relational provocations, whereas physically aggressive children showed more hostile attributions and emotional distress in response to hypothetical instrumental provocations. In another study conducted with 4th and 5th graders, Yeung and Leadbeater (2007) also found that HAB for relational events was associated with concurrent relational aggression. Further, MacBrayer et al. (2003) found that hostile attributions for relational events were associated with intentions to engage in an aggressive response in a clinical sample.

Finally, some researchers have found support for these associations in samples of adults, looking at specific functional subtypes of relational aggression. For example, Murray-Close et al. (2010) examined the association between SIP and reactive and proactive relational aggression in a community-based study of adults, aged 25–45 years old. They found that reactive relational aggression against peers and romantic partners was associated with HAB for relational provocations and with emotional sensitivity (i.e., feelings of distress in response to relational provocation). Similarly, Bailey and Ostrov (2008) found that HAB for relational events was uniquely associated with reactive relational aggression in a sample of adults.

However, others have failed to find support for the association between HAB and relational aggression and have questioned the relevance of the SIP model for understanding the development of relational forms of aggression and the development of aggression among girls. For example, Crain et al. (2005) conducted a study with 4th through 6th grade girls and found that SIP, including HAB for relational provocations, was not associated with peer-nominated relational aggression. Similarly, in a sample of 4th grade children, Nelson et al. (2008) found that HAB for relational events was not associated with relational aggression

sion for either boys or girls. Furthermore, Mikami et al. (2008) did not find an association between HAB and relational aggression in either adolescent girls who were diagnosed with ADHD or comparison adolescent girls. Finally, Godleski and Ostrov (2010) did not find an association between prior HAB for relational events and relational aggression in 6th grade. However, those categorized as high on both relational aggression and physical aggression demonstrated higher HAB for relational events, and girls showed higher HAB for relational events than boys.

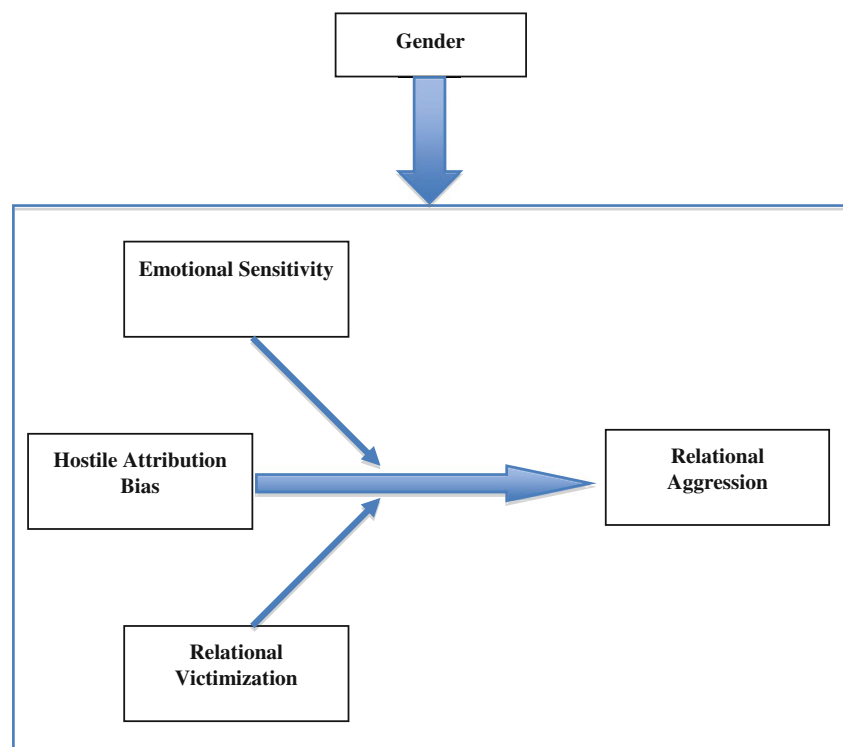
The Current Study

Given these mixed findings, further research is needed to examine the association between HAB for relational events and relational aggression. Although differences in study design may account for some of the mixed findings in this area, it is also possible that these inconsistent results reflect a failure to consider important moderators of the association between HAB for relational provocations and relational aggression. In the current study, we test a relational vulnerability model (see Fig. 1) that investigates moderators of the association between HAB and relational aggression. Crick initially developed the relational vulnerability model to provide a better understanding of the unique constellation of factors that put individuals at risk for engaging in relational aggression (Crick et al. 2003; Crick et al. 2004).

Whereas a number of interpersonal factors, such as HAB for relational provocations, had been studied as risks for relational aggression, she hypothesized that these factors did not act independently but instead conferred risk through their interaction. Specifically, she hypothesized that HAB for relational provocations would only translate into relationally aggressive behavior among children who exhibited additional vulnerabilities associated with interpersonal relationships (i.e., emotional sensitivity, relational victimization, and female gender).

According to the relational vulnerability model, emotional sensitivity to relational provocations may serve as a moderator of the association between HAB and relational aggression. Emotional sensitivity to relational provocations is related to HAB in that both are often assessed in the context of perceived relational provocation (e.g., Crick 1995; Crick et al. 2002). However, they are distinct in that HAB is a cognitive bias regarding the intent of the provocateur's actions, whereas emotional sensitivity is assessed as the distress one reports in response to perceived provocation. In fact, a number of studies have found that emotional sensitivity, or higher levels of emotional distress in response to ambiguous relational situations, is associated with relational aggression (Crick 1995; Crick et al. 2002; Murray-Close and Crick 2007). As relationally aggressive behaviors may often occur in response to stressors with peers, atypical cognitive and emotional reactions to these stressors may place children at risk for aggressive conduct. In the current investigation, we expected that children who

Fig. 1 Relational vulnerability model as proposed by Crick (Crick et al. 2003; Crick et al. 2004)



exhibited both heightened cognitive (i.e., HAB) and emotional (i.e., emotional sensitivity) reactivity to relational provocations would be especially at risk for involvement in relational aggression.

Experiences of relational victimization by peers may also moderate the association between HAB and relational aggression. In fact, evidence suggests that relational victimization is correlated with relational aggression in early childhood (e.g., Crick et al. 1999a), childhood (e.g., Putallaz et al. 2007), and adolescence (Leadbeater et al. 2006). Furthermore, relational victimization appears to be correlated with HAB for relational events (Hoglund and Leadbeater 2007; Yeung and Leadbeater 2007). Given these findings, we hypothesized that HAB would be most likely to result in aggressive responding among participants who frequently experienced peer stress or provocation with peers. In effect, children who assume hostile intent on the part of their peers and also frequently encounter provocation situations likely to elicit these cognitive processes may be most at risk for relational aggression.

Finally, HAB for relational provocations may be more strongly associated with relational aggression for girls than for boys. As described previously, research generally supports the idea that girls find relational acts more distressing, hurtful, harmful, and/or unacceptable than boys in preschool (Giles and Heyman 2005; Goldstein et al. 2002), elementary school (Crick 1995; Crick et al. 1996; Galen and Underwood 1997; Giles and Heyman 2005) and in adolescence (Coyne et al. 2006; Galen and Underwood 1997; Paquette and Underwood 1999). Although some studies have failed to find that HAB is associated with relational aggression among girls (Crain et al. 2005; Mikami et al. 2008), given theoretical predictions about the salience of these factors for girls (Crick and Zahn-Waxler 2003; Ostrov and Godleski 2010), as well as the findings indicating that girls find relational events more distressing than boys, we predicted that the proposed associations would be stronger for girls than for boys.

In sum, following the relational vulnerability model described by Crick and colleagues (Crick et al. 2003; Crick et al. 2004), we investigated two main research questions and hypotheses. Our first research question was whether factors that could be conceptualized as contributing to relational vulnerability would interact to confer risk for relational aggression. Thus, we were interested in testing moderators of the association between HAB and relational aggression. Specifically, we hypothesized that HAB for relational provocation would be associated with relational aggression only when emotional distress in response to perceived relational provocation and relational victimization were both high. That is, we did not expect that HAB would translate into aggressive behavior in all children; instead, we hypothesized that HAB would be associated

with relational aggression only in children who demonstrated other relational vulnerabilities. Therefore, we tested a relational vulnerability model in which HAB was expected to predict heightened relational aggression when relational victimization and emotional distress in response to perceived provocation were also high.

Although some theorists have examined mediation models in which HAB mediates the relation between emotional factors and aggression (e.g., Musher-Eizenman et al. 2004) or experiences of victimization and aggression (e.g., Hoglund and Leadbeater 2007), less work has explored how HAB interacts with social and emotional factors in the prediction of aggression. Given mixed findings regarding the association between HAB and aggressive conduct, an important goal for researchers is to identify the children for whom HAB may translate into aggression. To address this research question, we adopted a moderation, rather than mediation, model in the present study.

Finally, our second research question was whether the model would function differently for boys and girls. Given evidence suggesting that relational stressors are particularly salient and upsetting for females, we expected that the relational vulnerability model would more strongly predict relational aggression in girls than in boys.

Method

Participants

Participants were part of a larger study examining the association between aggression and adjustment. A total of 635 (50.2% female) third, fourth, and fifth-graders were recruited from elementary schools in a large Midwestern city during the fall of their school year. All students in participating classrooms were invited to participate. Although fourth-graders were targeted in the present study, some third ($N=22$) and fifth-graders ($N=62$) were included as well due to mixed-grade classrooms. A trained research assistant provided a 10-min presentation to each participating class describing the study in age-appropriate terms and answering student questions. Consent letters were then sent home with students; students with parental consent and who provided assent participated in the present study.

Thirty percent of the sample was African-American, 29% was European-American, 13% was Latino, 14% was Hmong, 4% was Asian, 4% was Native American, and 6% represented other ethnic groups. Individual-level socioeconomic status data were not available due to the fact that parents did not participate in the study. Based on school demographic information, the socioeconomic status of the sample was estimated to be lower class to middle class.

Specifically, 74% of students at participating schools qualified for free or reduced-cost lunches. The racial/ethnic and SES characteristics of the sample were representative of the participating schools. Each participant had parental consent and child assent to participate; the average parental consent rate was 71% of all students in participating classrooms. Children received a small item (e.g., Tootsie Pop) for returning a consent form signed by their parents (whether or not their parents provided consent to participate), and classrooms for which all children returned their consent forms (whether or not their parents provided consent) received a pizza party. Children who participated in the study received a small item (e.g., pencil, toy) as compensation for participation. All students from the larger study with data on study measures relevant to the present study were included in analyses.

Procedure

Ethical approval for the study was provided by the University of Minnesota Institutional Review Board and by the schools involved in the study. Assessments of aggression, victimization, and hostile attribution biases were conducted in the fall of the school year during two class-wide administrations, which each lasted approximately 45–60 min, separated by approximately 2 weeks. In the first administration, children completed a peer nomination instrument of aggression and victimization. In the second session, participants completed a battery of self-report questionnaires, including a measure of hostile attribution biases. During both classroom administrations, each item was read aloud to the class by a trained research assistant. One lead research assistant and three to five assistants were present in the classroom during the assessments to ensure that participants stayed on task and to answer any questions the participants may have had.

Finally, teachers completed measures of children's aggressive conduct and experiences of victimization. The teacher assessment took approximately 10 min per child to complete. Teachers and participants completed the research instruments approximately 2–4 months into the school year so that teachers and students had the opportunity to get to know each other prior to completing measures.

Measures

Relational Aggression Children's relationally aggressive behaviors were assessed using a multi-informant approach to minimize the limitations of many single measures of aggressive conduct (Xie et al. 2005). The first measure of children's aggression was a teacher report instrument developed in previous research (Crick 1996). Teachers were provided with five statements about relationally

aggressive behaviors (e.g., "When mad at a peer, this child ignores the peer or stops talking to the peer") and asked to rate how true each statement was of the target child on a scale from 1 (never true) to 5 (almost always true). Items were summed, yielding an overall relational aggression score. Evidence for the validity of this measure has been demonstrated in previous research (Crick 1996). Cronbach's alpha demonstrated high reliability of the measure for this sample, with $\alpha=0.93$ for relational aggression.

In an additional assessment of children's aggressive conduct, participating children completed peer reports of aggression. All participating children with informed parental consent and who provided assent participated in a classroom-administered assessment period. In the assessment session, the Children's Social Behavior Scale—Peer Report (CSBS-P) was used to assess children's relational aggression (Crick 1997). Participating children were provided with a class roster, and a trained research assistant read aloud five items describing relationally aggressive behaviors (e.g., "people who let their friends know that they will stop liking them unless the friends do what they want them to do"). Participants were asked to select up to three male and/or female students in the class who fit the description of each item (Crick et al. 1999b). The number of nominations each participant received were standardized within classroom and then summed. The internal reliability, test-retest reliability, factor structure, and validity of the relational aggression subscale of the CSBS-P have been established in prior research (e.g., Crick 1996, 1997; Crick et al. 1999b). In the present study, the internal consistency of the CSBS-P was good ($\alpha=0.86$ for relational aggression).

Teacher and peer reports of relational aggression were standardized and then averaged to yield a composite score for relational aggression. The internal consistency of the composite score was acceptable ($\alpha=0.66$).

Relational Victimization Reports of children's experiences of relational victimization were provided by teachers and peers. Teachers completed the Social Experience Questionnaire—Teacher Report (SEQ-T), an instrument developed in previous research (Cullerton-Sen and Crick 2005). This instrument includes three items describing experiences of relational victimization (e.g., "this child gets ignored by other children when a peer is mad at them"). Teachers rated how true each statement was of the target child on a scale from 1 (never true) to 5 (almost always true). Items were summed, yielding an overall relational victimization score. Evidence for the reliability and validity of this measure has been demonstrated in previous research (Cullerton-Sen and Crick 2005). Cronbach's alpha demonstrated high reliability of the measures for this sample, with $\alpha=0.87$ for relational victimization.

Experiences of relational victimization were also assessed with The Social Experiences Questionnaire – Peer Report (SEQ-P), a peer nomination instrument developed in previous research (Crick and Bigbee 1998). A trained research assistant read three items describing victims of relational aggression (e.g., “kids who are ignored by classmates when someone is mad at them”). Participants nominated up to three male and/or female children in their classroom who fit the description of each item. The number of nominations children received were standardized within classroom and then summed to yield victimization scores. Previous research has established the favorable psychometric properties of the SEQ-P (Crick and Bigbee 1998; Cullerton-Sen and Crick 2005). In the present study, the internal consistency of the relational victimization subscale of SEQ-P was good ($\alpha=0.70$).

Teacher and peer reports of relational victimization were standardized and then averaged to yield a composite score for relational victimization. The internal consistency of the composite score was acceptable ($\alpha=0.62$).

Hostile Attribution Bias Regarding Relational Provocation A hypothetical-situation instrument developed in past research, the Intent Attribution Measure (Crick 1995; Crick et al. 2002), was used to assess children’s hostile attribution biases regarding relationally-toned provocations. The instrument includes five hypothetical situations that depict relational peer conflicts (e.g., not getting invited to a friend’s birthday party), all of which describe the intent of the peer in ambiguous terms.

Children were asked to respond to two questions for each situation, both of which assess their hostile attributions for the hypothetical provocation. In the first question, children were presented with four possible reasons for the provocation and were asked to choose the most likely reason. Two of the reasons depict benign intent (e.g., the friend didn’t invite me to the birthday party because they were planning to invite me later) and two depict hostile intent (e.g., the friend didn’t invite me to the birthday party because he/she was trying to get back at me for something). In the second question, children are asked to indicate whether the provocateur was trying to be mean or not trying to be mean. Following procedures used in past research, children’s responses to the two questions were summed within each story and across stories to yield a total score reflecting hostile attribution bias regarding relational peer provocations (scores can range from 0 to 10). Past research has shown children’s responses to this instrument to be highly reliable (α s greater than 0.65 in three studies). Consistent with previous work, this scale was reliable in the present sample, $\alpha=0.78$.

Emotional Sensitivity Regarding Relational Provocation For each story, children were also asked to rate how mad or upset they would be “if the things in the story really happened to you” on a scale of 1 (not upset or mad at all) to 3 (very upset or mad). Children’s responses were summed across stories to yield emotional sensitivity scores regarding relational peer provocations (scores could range from 5 to 15). In the present sample, children’s emotional sensitivity scores exhibited high internal consistency with Cronbach’s $\alpha=0.77$.

Results

Descriptive data on all variables are presented in Table 1. Girls demonstrated significantly higher mean scores than boys on the composite measures¹ of both relational aggression, $t(633) = -3.91, p < 0.01$, and relational victimization, $t(633) = -2.97, p < 0.01$, as well as on hostile attribution bias, $t(633) = -3.17, p < 0.01$, and emotional sensitivity, $t(633) = -4.05, p < 0.01$. However, Levene’s test was significant for relational aggression and emotional sensitivity, suggesting the assumption of equality of variances may have been violated. Thus, the t-tests for those constructs must be interpreted with caution.

Overall correlations showed a significant association between relational victimization and relational aggression, $r(633) = 0.69, p < 0.01$, emotional sensitivity and relational aggression, $r(633) = 0.10, p < 0.01$, and HAB and relational aggression, $r(633) = 0.08, p < 0.05$. Table 2 shows the bivariate correlations computed separately by gender. Interestingly, HAB was not significantly associated with relational aggression for either boys or girls when correlations were calculated separately by gender.

A series of hierarchical regression analyses were run to explore the association between HAB regarding relational provocation and relational aggression. These analyses also included emotional sensitivity to relational provocation and relational victimization as predictors to test whether they moderated the relation between HAB and aggression. Thus, relational aggression served as the dependent variable and HAB, emotional sensitivity, and relational victimization were entered at Step 1. The two-way interactions between these variables were entered at Step 2, and the three-way interaction was entered at Step 3. Analyses were run separately by gender given preliminary findings indicating that gender significantly moderated the association between

¹ Although teacher and peer-reports of relational aggression and victimization are presented in the descriptive statistics in Table 1, only the composite measures are used in analyses and thus interpreted in the results and discussion.

Table 1 Means and standard deviations for relational vulnerability constructs

Variable	Total		Boys		Girls		Gender Difference
	Mean	(SD)	Mean	(SD)	Mean	(SD)	
Composite							
Relational aggression	0.00	0.87	-0.14	0.80	0.13	0.91	**
Relational victimization	0.01	0.84	-0.11	0.80	0.09	0.88	**
Teacher-Report							
Relational aggression	9.47	4.86	8.56	4.36	10.37	5.16	**
Relational victimization	4.94	2.45	4.72	2.38	5.15	2.50	*
Peer-Report							
Relational aggression	-0.24	3.76	-0.55	3.57	0.07	3.93	*
Relational victimization	-0.12	2.28	-0.38	2.17	0.13	2.36	**
Self-Report							
Hostile attribution bias	5.34	2.56	5.02	2.57	5.66	2.51	**
Emotional sensitivity	5.00	2.63	4.58	2.72	5.41	2.47	**

* $p < 0.05$, ** $p < 0.01$

the 3-way interaction and relational aggression, $t(619)=2.51$, $p < 0.05$ (for the 4-way interaction term). All predictors were centered prior to running analyses.

The results of these regressions are presented in Table 3. For girls, relational victimization was associated with relationally aggressive behavior. In addition, the interaction between HAB, emotional sensitivity, and relational victimization was significant.² Follow-up simple slope analyses indicated that HAB predicted relational aggression when combined with relatively high levels of relational victimization and emotional sensitivity following provocation, $t(311)=2.36$, $p < 0.05$. In contrast, HAB was not associated with relational aggression at low levels of emotional sensitivity and low levels of relational victimization, $t(311)=0.70$, $p=0.49$, at low levels of emotional sensitivity and high levels of relational victimization, $t(311)=0.21$, $p=0.83$, or at high levels of emotional sensitivity and low levels of relational victimization, $t(311)= -1.18$, $p=0.24$ (see Fig. 2). Interestingly, and unexpectedly, participants who were highly relationally victimized but exhibited low levels of emotional sensitivity exhibited relatively high levels of relational aggression, regardless of HAB. For boys, relational victimization was associated with relational aggression, $\beta=0.65$, $p < 0.01$. No other effects for boys were significant.

² To avoid issues of multicollinearity, we did not control for physical aggression and physical victimization in these analyses. However, we re-computed the analyses controlling for composite physical aggression and composite physical victimization (standardized teacher and peer reports combined), and the results remained the same. That is, the 3-way interaction was significant for girls, and the simple slopes revealed that HAB was associated with relational aggression only when relational victimization and emotional sensitivity were also high.

Discussion

The goal of this study was to test a relational vulnerability model of relational aggression (Crick et al. 2003; Crick et al. 2004). Specifically, we investigated potential moderators of the association between HAB and relational aggression in elementary school-aged children. To the best of our knowledge, this is the first study to examine relational victimization, emotional sensitivity to relational provocation, and gender as moderators of the association between HAB and relational aggression in children. Overall, our hypothesis that HAB would be associated with relational aggression among children with additional relational vulnerabilities was supported. In fact, HAB was only weakly correlated with relational aggression in the overall sample, and was not significantly associated with relational aggression for either boys or girls when the association was examined separately by gender. Instead, the findings highlighted the high level of complexity involved in the association between social-cognitive factors and social behaviors. Specifically, HAB was associated with higher relational aggression among girls who also exhibited heightened levels of relational victimization and emotional

Table 2 Bivariate correlation coefficients for relational vulnerability constructs for boys (below diagonal) and girls (above diagonal)

Variable	1.	2.	3.	4.
1. Relational aggression	–	0.72**	0.03	-0.01
2. Relational victimization	0.65**	–	0.02	0.02
3. Hostile attribution bias	0.10	-0.02	–	0.57**
4. Emotional sensitivity	0.18**	0.15**	0.45**	–

* $p < 0.05$, ** $p < 0.01$

Table 3 Hostile intent attributions, emotional sensitivity, and relational victimization in predicting relational aggression in boys and girls

Gender	Step	Predictor	β	T Value	F, ΔF	R^2 , ΔR^2
Girls	1	Hostile Intent Attributions (HIA)	0.05	0.97	112.83***	0.52
		Emotional Sensitivity (ES)	-0.06	-1.17		
		Relational Victimization (RV)	0.72***	18.36		
	2	HIA X ES	0.01	0.25	0.69	0.00
		HIA X RV	0.07	1.23		
		ES X RV	-0.07	-1.35		
3	HIA X ES X RV	0.11*	2.28	5.21*	0.01	
Boys	1	Hostile Intent Attributions (HIA)	0.09	1.88	81.60***	0.44
		Emotional Sensitivity (ES)	0.05	0.96		
		Relational Victimization (RV)	0.65***	15.03		
	2	HIA X ES	-0.07	-1.51	2.14	0.01
		HIA X RV	0.08	1.60		
		ES X RV	0.01	0.20		
	3	HIA X ES X RV	-0.06	-1.17	1.38	0.00

* $p < 0.05$ *** $p < 0.001$

sensitivity. This suggests that girls who demonstrate a number of relational vulnerabilities are at risk for engaging in relational aggression. This account is consistent with a relational vulnerability model in which the interaction of a number of relational risk factors, rather than a single individual risk factor, places children at risk for involvement in relational aggression.

These findings may shed light on inconsistencies in past research. Previous studies have typically examined a main effect between HAB and relational aggression and have not assessed moderators other than gender. Thus, the absence of a link between HAB and relational aggression in previous research (e.g., Crain et al. 2005; Godleski and Ostrov 2010; Mikami et al., 2008; Nelson et al. 2008) may be due to the omission of relevant moderators. Our findings suggest that we must look beyond simple main effects to more complex

interactions to gain a clearer picture of the association between HAB and relational aggression.

Consistent with our hypotheses, we did not find support for the relational vulnerability model in boys. That is, emotional sensitivity and relational victimization did not moderate the association between HAB and relational aggression in boys. It is possible that boys differ from girls in how they react to relational stressors. Thus, boys who demonstrate relational vulnerability (i.e., who show HAB and emotional sensitivity for relational events and who are relationally victimized) may be at risk for other retaliatory behaviors, such as physical aggression. This is consistent with theoretical predictions that individuals will respond to social cues with behavioral responses that are consistent with their gender schemas (Ostrov and Godleski 2010).

Although the majority of our findings confirmed study hypotheses, an interesting and unexpected pattern emerged among girls who were highly relationally victimized but exhibited relatively low levels of emotional sensitivity. Specifically, these girls tended to engage in high levels of relational aggression, regardless of their HAB. Although these findings were unexpected, they are consistent with an emerging line of theory and research suggesting that some aggressive individuals may engage in aggression in the absence of emotional arousal, particularly when the function of aggression is instrumental in nature (e.g., to gain a desired resource; Frick and Morris 2004). These findings are also consistent with a recent psychophysiological study indicating that low levels of autonomic reactivity to relational provocation (which some researchers have argued reflect a physiological assessment of anger; see Hubbard et al. 2002) are associated with relational aggression among girls (Sijtsema et al. 2011). It is possible that these victimized girls with low levels of emotional sensitivity may be particularly likely to engage in proactive, rather than reactive functions, of aggressive conduct (see

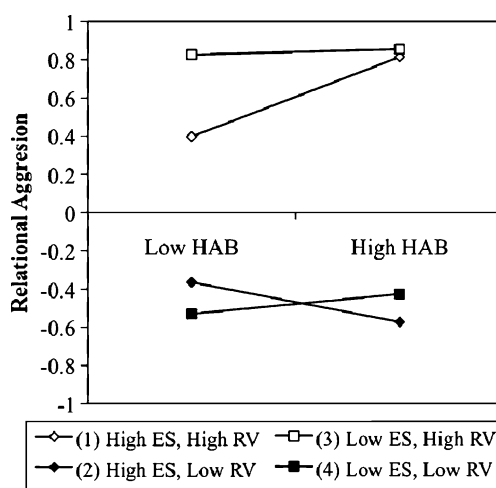


Fig. 2 Association between hostile attribution bias and relational aggression in girls, moderated by emotional sensitivity and relational victimization (note: HAB = hostile attribution bias, ES = emotional sensitivity, RV = relational victimization)

Hubbard et al. 2002). In fact, as HAB is hypothesized to serve as a risk factor for reactive but not proactive functions of aggression (e.g., Crick and Dodge 1996), the lack of an association between HAB and relational aggression may reflect the fact that these girls were engaging in proactive relational aggression. However, future research is necessary to address this important point.

Strengths and Limitations

The findings from the present study should be considered in the context of study strengths and limitations. Strengths include employing a relatively large and diverse sample. In addition, multiple informants (self-report, peer-report, and teacher-report) were employed to assess study variables, decreasing the likelihood that the results simply reflect shared method variance. However, although our study has provided novel insights regarding the complex nature of social-information-processing and relational aggression, it is not without limitations. First, given the cross-sectional nature of these data, we cannot discern a causal model or determine a timeline for which factors developed first. Research on instrumental HAB and physical aggression suggests that HAB may precede aggressive responses, both immediately (Dodge 1980) and over time (Dodge et al. 1990). However, longitudinal research is necessary to address whether the relational vulnerability model predicts increases in aggression over time. In addition, future research is necessary to elucidate the dynamic associations between HAB, emotional sensitivity, and relational victimization over time. For example, girls who are frequently the targets of relational victimization may develop HAB and emotional sensitivity because their past victimization experiences put them on heightened alert for future victimization experiences. In other words, for children who are frequently victimized, it may be better to anticipate hostile intent, even in ambiguous situations, so one can better cope or retaliate. On the other hand, it is also possible that girls who demonstrate a pre-existing HAB and emotional sensitivity to provocation may be victimized by their peers, which may exacerbate their HAB and emotional sensitivity and increase their risk for using relationally aggressive behaviors. Future longitudinal research adopting a developmental cascades approach (Masten et al. 2005) is needed to explore how these factors emerge and interact across development. If relational aggression were included in these longitudinal models, this work would provide an important test of potential mediators of the association between HAB and relational aggression over time. In fact, although we believe that the moderation model in the present study provides a first step in addressing the question of when HAB might be most likely to translate into aggressive behavior and in evaluating the relational

vulnerability model, we believe that future research would benefit from a focus on potential processes that might explain the association between HAB and relational aggression.

Another limitation of our study is that our measure of emotional sensitivity to relational provocation is based on self-report. Although this approach has been used in past research (Crick 1995; Crick et al. 2002) and the measure demonstrated internal consistency in the current study, it may be helpful in future research to combine this measure with reports from other informants, such as teachers, parents, and/or peers, as well as physiological measures of reactivity (e.g., Murray-Close and Crick 2007), to obtain further information about how children respond to relational provocation.

A final limitation of our study is that we did not include a measure of HAB for instrumental provocation. It is possible that we would have found that HAB for instrumental provocations was associated with aggression for boys. However, given the substantial number of studies conducted on HAB for instrumental provocation, coupled with our focus on relational aggression, we chose to only include a measure of relational provocations.

Clinical Implications

There are important clinical implications derived from the results of the current study. These findings support the proposed relational vulnerability model in which it is not a single construct that serves as a risk factor, but a cluster of relational factors that, together, place children at risk for relational aggression. In other words, it is those girls who are relationally victimized and demonstrate hostile attribution bias and emotional distress in response to relational provocation who are likely to be relationally aggressive. Prevention programs targeting relational aggression could directly target those risk factors. For example, interventions could focus on reducing hostile attribution bias and emotional distress in response to ambiguous relational situations and on developing appropriate strategies for coping with relational victimization. On an individual level, clinicians who work with girls who demonstrate this cluster of risk factors may intervene in those same areas (HAB, emotional distress, relational victimization) and may wish to closely monitor those clients for aggressive behavior. Similarly, clinicians who work with relationally aggressive girls may want to explore how their clients respond to perceived relational provocations (e.g., HAB, emotional distress) and whether or not their clients also experience relational victimization. These may be important areas of focus in clinical intervention.

Another important implication from the findings is that, for both boys and girls, relational victimization was

associated with relational aggression. Thus, clinicians who are working with clients (male or female) who are either relationally aggressive or victimized may want to take a general approach, addressing both ways of dealing with victimization experiences and finding alternative, positive behaviors rather than resorting to aggression. Therefore, in addition to contributing to the literature on relational aggression, these findings help to advance interventions for relational aggression.

Conclusions

The goal of this study was to investigate how hostile attribution bias for relational provocations is related to relational aggression, given the mixed findings from past research. We hypothesized that part of the reason that there are mixed findings in the literature is due to the complexity of the association. Our study supported the hypothesis that it is the combination of HAB, emotional sensitivity, and relational victimization that puts girls at risk for engaging in relational aggression. However, future research is needed to replicate this model in longitudinal studies, perhaps using multiple measures of HAB and emotional sensitivity. Thus, we hope we have laid the groundwork for future studies to move past looking at simple main effects to testing these more complex associations across development.

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