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Relational aggression, victimization, and adjustment during middle childhood

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Abstract

A secondary analysis of the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development was conducted to test the mechanisms by which relational aggression in third grade was associated both directly and indirectly with relational victimization in sixth grade. A large sample ($N = 1{,}035$; 522 girls; $M = 8.3$ years old; $SD = 0.23$) and multiple informants (teacher, child, and parent report) and methods were used to test several theoretically driven hypotheses. Our path analysis model suggested evidence for both direct and indirect pathways consistent with the sequential social process model of peer harassment. Relational aggression was significantly associated with future relational victimization even after controlling for physical aggression and gender. Loneliness mediated the direct association between relational aggression and peer victimization. A second model testing the reverse direction of effect revealed that relational victimization in third grade predicted relational aggression in sixth grade and was associated with loneliness and depressive symptoms in fifth grade, but there was no evidence for any of the indirect pathways.

In keeping with an organizational perspective of development, peer relationships are a fundamental developmental system. Establishing peer competence during early childhood is essential for adaptive development and for the negotiation of subsequent developmental tasks (Ladd, Price, & Hart, 1990; Sroufe, Egeland, & Carlson, 1999). In addition, an understanding of peer social functioning may assist professionals in identifying those children who may need additional support or intervention services (e.g., Odom et al., 1999). From a developmental tasks theoretical perspective, the major developmental task with which children in middle childhood are confronted concerns the forming, sustaining, and coordinating of peer interactions (Sroufe, Carlson, & Shulman, 1993). The long-term costs are serious for not developing appropriate positive peer relationships during childhood (Denham & Holt, 1993).

The aggression literature generally has focused on physically aggressive acts as the hallmark behavior of externalizing problems, which are often more representative of boys than girls during childhood (Collett, Ohan, & Myers, 2003; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 2004). However, recent evidence suggests that other subtypes of aggression (i.e., indirect, relational, and social) may be more developmentally salient for girls (Björkqvist, 1994; Cairns, Cairns, Neckerman, Ferguson, & Gariepy, 1989; Crick & Grotpeter, 1995; Galen & Underwood, 1997). That is, girls may use relational aggression more than they display physical aggression, and relational aggression may be more likely to be associated with adjustment problems for girls relative to boys during this developmental period (e.g., Murray-Close, Ostrov, & Crick, 2007; Putallaz et al., 2007). Relational aggression is defined as behaviors in which damage or threat of damage to salient relationships serves as the agent of harm (e.g., exclusion, ignoring or the silent treatment, and spreading malicious gossip, secrets, lies, or rumors; Crick & Grotpeter, 1995). Recent research has indicated that indirect, relational, and social aggression may be associated with *both* positive and negative outcomes across developmental periods (Heilbron & Prinstein, 2008). For example, a recent multimethod and informant study revealed that relational aggression is associated with increases in both positive and negative friendship qualities (Banny, Heilbron, Ames, & Prinstein, 2011). In addition, relational aggression is positively associated with perceived popularity (e.g., Cillessen & Mayeux, 2004), but these same children are often not accepted by their peers (e.g., Bowker, Ostrov, & Raja, 2012; Rose, Swenson, & Waller, 2004). Relational aggression is associated with intimate friendships as well as with time-dependent increases in internalizing symptoms (Murray-Close et al., 2007). However, there is also evidence suggesting that relational aggres-

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sion is associated directly with poor social–psychological adjustment in several developmental periods (e.g., peer rejection, loneliness, depressed affect, anxiety symptoms, and delinquency; Crick, Casas, & Ku, 1999; Crick, Casas, & Mosher, 1997; Crick, Ostrov, & Werner, 2006; Ellis, Crooks, & Wolfe, 2009; Kawabata, Crick, & Hamaguchi, 2010; McNeilly-Choque, Hart, Robinson, Nelson, & Olsen, 1996). In middle childhood and early adolescence these behaviors may be associated with serious symptoms of psychopathology (e.g., attention-deficit/hyperactivity disorder, Blachman & Hinshaw, 2002; Zalecki & Hinshaw, 2004; conduct problems and oppositional defiant symptoms, Keenan, Coyne, & Lahey, 2008) and personality pathology (e.g., borderline personality features, Crick, Murray-Close, & Woods, 2005; psychopathy, Marsee & Frick, 2007). To date, however, we do not fully understand how relationally aggressive behavior may place children at risk for adaptive or maladaptive developmental trajectories.

There is also a need for further work to elucidate the developmental predictors of peer victimization (Sullivan, Farrell, & Kliewer, 2006). Researchers have documented the important link between physical aggression and physical victimization (Hodges & Perry, 1999; Schwartz et al., 1998). That is, behavioral problems and physical aggression predict increases in physical victimization (Dhami, Hoglund, Leadbeater, & Boone, 2005; Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999). In addition, there is a subgroup of children who may display elevated levels of both physical aggression and victimization (i.e., provocative victims or aggressive victims; e.g., Schwartz, Proctor, & Chien, 2001). Despite the extensive study of physical victimization, only recently have peer relationship experts begun to study relational victimization (e.g., Crick & Grotpeter, 1996; Prinstein, Boergers, & Vernberg, 2001; Sullivan et al., 2006; Yeung & Leadbeater, 2007) or related constructs of indirect victimization (e.g., Craig, 1998; Kochenderfer & Ladd, 1996b; Waasdorp & Bradshaw, 2011) and social victimization (e.g., Rosen et al., 2009; Sandstrom & Cillessen, 2003). A recent meta-analysis firmly supports the need for focus on the development of relational victimization and associations with maladaptive pathways (Hawker & Boulton, 2000). Relational victimization is the chronic or frequent receipt of relational aggression (Crick & Grotpeter, 1996). Crick and Grotpeter (1996) demonstrated that relational victimization was associated with indices of social–psychological adjustment (e.g., loneliness and social anxiety), even after statistically controlling for physical victimization. Moreover, Crick and Bigbee (1998) found that relational victimization was associated with social–psychological adjustment problems even after controlling for relational aggression. In addition, Prinstein et al. (2001) found that relational victimization added to physical victimization in attempts to understand the development of psychopathology. During middle childhood and early adolescence, relational and physical victimization have differential outcomes (e.g., externalizing and internalizing problems, and substance use; Cullerton-Sen & Crick, 2005; Leadbeater, Boone, Sangster, & Mathieson, 2006; Sullivan et al., 2006).

Social Process Model

Existing theory suggests that peer aggression and victimization are potentially associated in important ways across development. Boivin and Hymel (1997) introduced the sequential social process model of the causes of peer harassment and posit that stable behavioral tendencies like aggression may directly lead to peer victimization and ultimately negative social self-perceptions (Boivin, Hymel, & Hodges, 2001). An indirect pathway was also hypothesized, whereby aggression first predicted peer rejection and then indirectly peer victimization. Evidence from the Quebec Longitudinal Study of Children confirmed both of these pathways for physical aggression and victimization. Research by Buhs and Ladd (2001) has provided further confirmation of this model. Recent work has demonstrated support for the prospective direct pathway between relational aggression and relational victimization in a sample of young children (Ostrov, 2008). Moreover, peer rejection partially but significantly mediated the association between relational aggression and future relational victimization (Ostrov, 2008). In addition, Giesbrecht, Leadbeater, and Macdonald (2011) in a longitudinal study of children from Grades 1 to 3 showed that those children who were physically aggressive according to teacher reports showed increases in self-reported peer victimization over time. Moreover, those who were high on teacher-reported emotional dysregulation (e.g., "has temper tantrums") at school increased in their rates of relational victimization over time (Giesbrecht et al., 2011). Thus, the direct and indirect path sequential social process model of the causes of peer harassment (Boivin et al., 2001) was supported for relational aggression and victimization in early childhood, but no known studies have tested these links in middle childhood. To date, only two other known mediation studies of relational aggression and victimization have been conducted, and they were an exploration of the role of hostile attribution biases (HAB; Yeung & Leadbeater, 2007) and other social–cognitive processes (Hoglund & Leadbeater, 2007) believed to be integral to the sequential social process model. For example, Hoglund and Leadbeater (2007) found that hostile attributions for instrumental provocations partially mediated the concurrent link between physical aggression and relational victimization in early adolescence. In addition, social perspective awareness and interpersonal skills partially mediated the concurrent association between physical aggression and relational (as well as) physical victimization. An additional study by Hoglund, Lalonde, and Leadbeater (2008) further documented that individual differences in the capacity to understand others' social cues and emotions may be related to children's overall adjustment in middle childhood.

Existing theory and literature also supports an alternative developmental model in which peer victimization predicts aggressive behavior over time. Rose and Rudolph (2006) pre-

sented a peer-socialization model that supports hypothesized paths from relational victimization (i.e., "exposure to peer stress") to relational aggression (p. 116). Yeung and Leadbeater (2007) posited that aggression may be a retaliatory response to peer victimization, and in the first known test of this theoretical assertion these authors found evidence that relationally victimized children become more relationally aggressive over time. Furthermore, in a short-term prospective study with young children, Ostrov (2010) replicated this effect by demonstrating that relational victimization was uniquely associated with increases in relational aggression, whereas physical victimization was uniquely associated with increases in physical aggression. Building on Yeung and Leadbeater's (2007) assertion, Ostrov (2010) argued that children who are involved in peer victimization experiences learn from these interactions, and if properly reinforced for the display of aggressive behaviors, they may adopt these behaviors as a potentially effective strategy for reducing their own peer victimization.

Hypothesized Mediators

Three hypothesized mediators of the prospective relations between relational aggression and victimization will be tested: loneliness, HAB for relational provocations, and depressive symptoms. We believe these effects will be statistically unique, which is consistent with prior literature that has, for example, found that relational victimization was uniquely associated with both depression symptoms and loneliness (Prinstein et al., 2001). Moreover, these constructs were treated as mediators in the present study due to the aforementioned theory and research that suggests they may serve as indirect processes between relational aggression and relational victimization. The present study was not designed to test all possible associations among these constructs; rather, we attempt to test the most theoretically derived set of hypotheses from the extant developmental literature.

Loneliness

Although normative across development, feelings of loneliness at school are an important risk factor for subsequent adjustment problems (Asher & Paquette, 2003), especially internalizing problems (Goosens & Beyers, 2002). Children's own reports of loneliness have been found to be associated with peer rejection status in both the early school years (Cassidy & Asher, 1992) and middle childhood (Asher & Wheeler, 1985). Loneliness is further associated with having friendships that do not fulfill important relationship provisions (e.g., validation and caring or help and guidance; Parker & Asher, 1993). Lonely children tend to be more anxious, physically aggressive, and excluded by peers in kindergarten (Coplan, Closson, & Arbeau, 2007), more socially withdrawn in middle childhood (Prakash & Coplan, 2007), and victimized by peers in adolescence (Storch et al., 2007). Coplan et al. (2007) further documented that after controlling for peer exclusion, physical aggression was significantly related to loneliness for girls but not for boys. They argued that additional research including assessments of relational aggression was important when exploring predictors of loneliness in young children.

Several studies support the theoretical link between relational aggression and loneliness (Crick, 1997; Crick & Grotpeter, 1995; Soensens, Vansteenkiste, Goossens, Duriez, & Niemiec, 2008; cf. Prinstein et al., 2001). For example, Crick and Grotpeter (1995) demonstrated that relationally aggressive children reported significantly higher levels of loneliness, depression, and isolation relative to their peers that were not engaging in relational aggression at high levels. Moreover, a randomized intervention for explicitly reducing relational aggression among girls during middle childhood demonstrated that children receiving the intervention program were more likely to decrease in loneliness from baseline to posttreatment relative to the controls, and this was a moderate effect (Leff et al., 2009). Scholars have posited that because children who display relational aggression are often rejected by their peers (Crick, 1997; Ostrov, 2008), it is difficult for them to initiate and support the formation of high-quality friendships during early developmental periods, which may lead to loneliness (Soensens et al., 2008). Recent evidence supports these hypotheses in that self-reported relational aggression was significantly and positively associated with self-reported loneliness, although share method variance may have artificially increased the effects (Soensens et al., 2008). Theoretically, much like peer rejection (Bierman, 2004; Ostrov, 2008), loneliness may increase the likelihood of being an easy target for peer victimization.

The link between loneliness and peer victimization is well established (Boulton & Underwood, 1992; Kochenderfer & Ladd, 1996a; Schwartz, Farver, Chang, & Lee-Shin, 2002). Crick and Grotpeter (1996) have documented the concurrent link between relational victimization and loneliness in middle childhood, and this association was supported in adolescence (Prinstein et al., 2001). In a sample of children with diabetes, self-reports of relational victimization were positively associated with feelings of loneliness (Asher Loneliness Scale; Storch et al., 2004). Finally, Crick and Bigbee (1998) reported that feelings of loneliness was concurrently associated with relational victimization for girls and boys even after controlling for relational aggression and several indices of adjustment problems (e.g., peer rejection, social anxiety, emotional distress). Despite the lack of prospective findings, the concurrent results provide justification for testing an indirect pathway from relational aggression to loneliness and in turn relational victimization. In sum, this theory and literature suggests that relationally aggressive behavior predicts feelings of loneliness because perpetrators of social exclusion may have limited opportunities for high-quality peer relationships (Soensens et al., 2008). Recent findings have demonstrated that positive friendship provisions or reporting receiving help from friends serves as a protective factor against relational victimization (Schmidt & Bagwell, 2007). Thus,

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loneliness is theorized to in turn predict subsequent peer victimization due to the reduced probability of having social support and high-quality friends to intervene in future peer harassment situations.

HABs

HABs are a particular social–cognitive attribution that has been widely studied with respect to physical aggression and instrumental provocation situations. In keeping with the social-information processing (SIP) model of children's adjustment, Crick and Dodge (1994) theorize that after encoding of internal and external cues, individuals interpret those cues. It is at this second step that attributions of hostile intent may be generated. The SIP model has been widely used to explain the development of aggressive behavior from early childhood to adolescence (Egan, Monson, & Perry, 1998; Lemerise, Gregory, & Fredstrom, 2005). Studies that have explored both physical and relational aggression have shown that participants categorized as relationally aggressive display HAB for ambiguous relational provocation scenarios (e.g., not being invited to a party), whereas physically aggressive individuals display HAB for ambiguous provocations of an instrumental (e.g., a physical bump from behind) manner (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002; cf. Crain, Finch, & Foster, 2005; Nelson, Mitchell, & Yang, 2008). Bailey and Ostrov (2008) recently explored these associations in emerging adulthood, and in keeping with predictions they found that reactive physical aggression was uniquely associated with HAB for instrumental provocations, whereas reactive relational aggression was uniquely associated with HAB for relational provocations.

Associations between HAB and peer victimization have also been theorized and supported. In a novel study, Yeung and Leadbeater (2007) found that HAB for relational provocations partially mediated the concurrent association between relational aggression and relational victimization. The present study is informed by this past theory and research suggesting an indirect pathway and will add to this growing body of work by examining the prospective associations between these constructs. In sum, in keeping with prior literature (Godleski & Ostrov, 2010), we argue relational aggression may predict future HAB for relational provocations, which is also in keeping with the cyclical and reinforcing feedback process implied in the SIP model (Crick & Dodge, 1994). In turn, we posit that having a HAB increases the probability of future peer victimization. However, there is some evidence that HAB might also be an indirect mechanism that accounts for the association between peer victimization and future aggression. For example, Rosen, Milich, and Harris (2007) proposed a model that integrates some of the core features of Crick and Dodge's (1994) reformulated social information processing model of children's social–psychological adjustment and asserts that peer victimization is associated with social–cognitive processes like the development of "victim schemas" that when activated under ambiguous threat conditions may lead children to engage in aggressive behaviors (p. 212).

Depressive symptoms

The link between depressive symptoms and both externalizing problems and victimization has been supported (e.g., Kochenderfer-Ladd & Skinner, 2002). Internalizing problems are a major correlate and outcome of relational aggression during middle childhood (Crick et al., 2006; Ellis et al., 2009; Kawabata et al., 2010; Murray-Close et al., 2007). For example, in a large and diverse sample, relational aggression trajectories were positively associated with growth in internalizing problems for both boys and girls (Murray-Close et al., 2007). In addition, a recent study of school-aged children ($N = 276$) admitted to a child psychiatric inpatient facility revealed that relational aggression was directly associated with depressive symptoms, which in turn was associated with suicidal ideation, even after controlling for physical aggression and history of maltreatment (Fite, Stoppelbein, Greening, & Preddy, 2011).

Internalizing problems and relational victimization have also been associated in past studies (Crick & Grotpeter, 1996; Crick & Nelson, 2002; Cullerton-Sen & Crick, 2005; Hoglund & Leadbeater, 2007). For example, relational victimization by a friend was uniquely associated with internalizing problems controlling for physical victimization by a friend in a sample ($N =$ 496) of third to sixth graders (Crick & Nelson, 2002). Physical victimization by a friend did not uniquely predict internalizing problems controlling for relational victimization (Crick & Nelson, 2002). Self-reports of relational victimization have been found to be positively associated with concurrent depressive symptoms (i.e., Children's Depression Inventory [CDI]; Storch et al., 2004), even after controlling for the influence of physical victimization. In middle childhood, relational victimization has been found to be uniquely associated with depressive symptoms in typically developing ethnically diverse samples as well (Storch, Phil, Nock, Masia-Warner, & Barlas, 2003; see also Prinstein et al., 2001). Finally, as mentioned previously, Schmidt and Bagwell (2007) recently documented that positive friendship quality, marked by certain relationship provisions (e.g., help from the friend), moderated the association between relational victimization and self-reported depressive symptoms (as assessed by the CDI). That is, girls who indicated they received a high amount of help from friends were less likely to be relationally victimized and less likely to be depressed when they were relationally victimized. In keeping with this past theory and research, we argue that relationally aggressive children who experience depressed affect and distress may be more likely to be seen as "easy" targets by peers, and recent research suggests that vulnerable and depressed children are likely to be targets of future peer victimization (Sweeting, Young, West, & Der, 2006). Thus, there is sufficient evidence to hypothesize an indirect prospective effect from relational aggression to depressive symptoms and in turn relational victimization.

Role of Gender

Theory suggests several possible differences (Ostrov & Godleski, 2010). Both within- and between-group gender differences

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have been posited. The within-gender differences seem to be rather robust with school-aged samples. That is, boys typically use physical aggression more than relational aggression, whereas girls typically display more relational aggression than physical aggression (e.g., Putallaz et al., 2007). The current literature appears to suggest that mean-level differences in relational aggression are present (favoring the hypothesis that girls are more relationally aggressive than boys) but that the magnitude of the effect is small and trivial (see Card, Stucky, Sawalani, & Little, 2008). Given the possibility of gender effects, we statistically control for the role of gender in the present study.

Justification of Methods

In the present study, we elected to use a teacher report of aggression and parent report of peer victimization for several reasons. First, peer reports, which are often the gold standard form of aggression assessment during middle childhood (Perry, Kusel, & Perry, 1988), and self-reports, which are often used for peer victimization assessments in this developmental period (Ladd & Kochenderfer-Ladd, 2002), were not included as part of the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD) data set. Second, teachers appear to be valid and reliable reporters of school-aged children's aggressive behavior and are often used when peer reports are not available (Crick, 1996; Henington, Hughes, Cavell, & Thompson, 1998; Ladd & Profilet, 1996). Third, teacher reports of peer victimization during middle childhood are rare (Ladd & Kochenderfer-Ladd, 2002), perhaps because parents may be more privy to peer victimization than teachers during this developmental period in which children move to different classrooms during the day. Fourth, parent reports of peer victimization have been found to be reliable and valid in the past and more stable than teacher reports of peer victimization over longer time intervals (Ladd & Kochenderfer-Ladd, 2002). Moreover, parent reports of relational victimization are moderately correlated with both self-reports and peer reports of relational victimization (Cole, Maxwell, Dukewich, & Yosick, 2010). Fifth, the use of independent, multiple informants from various contexts is a clear strength of the present study. The timing of our assessments was based on both conceptual and practical considerations. That is, our a priori goal was to maintain as much independence between constructs and assessment periods as possible. Given our theoretical model, we selected the first time point in which relational aggression/victimization assessments were available in the NICHD SECCYD study (Grade 3), and we also selected the oldest assessment of relational aggression/victimization available to us at the time of our study conceptualization (Grade 6). We a priori selected fifth grade as the optimal assessment period for our mediators, given the desire to maintain temporal independence from the predictor and outcome. In addition, given the cognitive demands of the self-report tasks, we selected the fifth-grade assessment period rather than fourth grade.

Hypotheses

In sum, the primary goal of the current study is to identify potential mechanisms by which aggression and peer victimization are associated in middle childhood. We hypothesize that a significant direct pathway from relational aggression in third grade to relational victimization in sixth grade will be revealed. Moreover, mechanisms of indirect association are proposed and will be tested. We hypothesize that loneliness will partially mediate the prospective association between relational aggression in third grade and relational victimization in sixth grade. Next, we specifically hypothesize that HAB for relational provocations will partially mediate the association between relational aggression and future relational victimization. We further hypothesize that depressive symptoms will partially mediate the prospective association between relational aggression in third grade and relational victimization in sixth grade. In addition, the reverse direction of effects will also be tested. That is, a second model will be tested in which relational victimization will serve as the initial predictor in third grade, the three mediators will be maintained, and relational aggression will be the key outcome variable in sixth grade. Prior theory and research suggests support for this model, and we anticipate direct paths from relational victimization to future relational aggression. Based on the aforementioned past theory and research, we hypothesized that HAB will partially mediate the direct association between relational victimization and aggression. We examine if loneliness and depressive symptoms also mediate these associations in the alternative model, but given the novelty of these developmental paths, these effects were exploratory. The respective hypotheses for each model will be tested simultaneously in conservative structural equation modeling (SEM) path models to control for the associations among the potential mediators and reduce the number of models and risk for Type 1 error.

Method

Participants

The present study includes the third phase, or Grades 3 through 6, of the NICHD SECCYD, which was conducted by a network of investigators, the ECCRN. In this longitudinal data collection, participants were recruited beginning in January 1991 through November 1991 from hospitals in 10 urban and suburban collection sites throughout the United States. A conditionally random sampling plan was employed, such that there was a mixture of mothers returning to work and those not, and there was demographic diversity because both single- and two-parent homes were included (for details, see NICHD ECCRN, 2001; NICHD ECCRN & Duncan, 2003). A sample of 1,364 women and their newborn children was recruited. It is important to note that the sample is not sta-

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tistically representative of a specific population; however, it is demographically diverse (Dearing, McCartney, & Taylor, 2006). In Phase III, 1,077 families remained in the study, indicating a high rate of retention from birth (79%). For the purposes of the study, those that had missing data (3.4%) on four or more of the key study variables (i.e., more than half of the variables) were removed, resulting in a sample of 1,039. Another four participants were also removed because two participants were missing gender demographic information and another two were extreme multivariate outliers, resulting in a sample of 1,035 ($N = 522$ girls). After this attrition across the study and removal of participants with significant missing data, the ethnicity of the remaining sample comprised: American Indian, Eskimo, Aleutian, Asian or Pacific Islander (2%), Black/African American (13%), other race (5%), or White/Caucasian (80%). Instead of being based on age, the data collected during these grades was collected on a year in school basis. However, the average age was 100 months ($SD = 2.78$), or 8 years, 4 months at the third grade. Families and children who stayed in the study from birth through third grade were more likely to be white and to have a higher income to needs ratio (NICHD ECCRN, 2004).

Measures

Relational aggression/victimization. Teacher report of relational aggression in third grade (and sixth grade) consists of six relational aggression items (e.g., "ignoring another child when s/he is mad at him or her" or "telling friends that s/he will not like them if they don't do what s/he says.") from the Children's Social Behavior Scale—Teacher Report (CSBS-TR: Crick, 1996; Crick, Bigbee, & Howes, 1996). There are also three items (e.g., "Is excluded from peers' activities" and "Peers say negative things about him/her to other children") that index relational victimization from the Perceptions of Peer Support Scale (Kochenderfer & Ladd, 1996a) and from the Child Behavior Scale (Ladd & Profilet, 1996), which was used in both third and sixth grades. Teachers rated the CSBS-TR aggression items, and mothers completed the Perceptions of Peer Support Scale/Child Behavior Checklist victimization items on a 3-point scale (0 = *not true*, 1 = *sometimes true*, and 2 = *often true*), which varies from the original 5-point scale (Crick, 1996). Items were summed to create scores for relational aggression and victimization. The relational aggression scale specifically has demonstrated a Cronbach α of 0.89 (Crick et al., 1996). Past relational victimization measures with the same number of items and similar content (e.g., the Social Experiences Questionnaire–Teachers) has demonstrated appropriate levels of internal consistency (Cronbach $\alpha = 0.82$) and significant correlations with both peer reports ($r = .34$, $p < .01$) and self-reports ($r = .29$, $p < .05$) of relational victimization during the same developmental period (Cullerton-Sen & Crick, 2005). In the present study, reliability was acceptable for teacher-reported relational aggression in third grade (Cronbach $\alpha = 0.83$) and sixth grade (Cronbach $\alpha = 0.84$). In addition, reliability was acceptable for parent-reported relational victimization in third grade (Cronbach $\alpha = 0.79$) and sixth grade (Cronbach $\alpha = 0.76$). In support of the validity of the relational victimization scale during sixth grade, the teacher reports and parent reports were significantly associated in the present data set ($r = .30$, $p < .001$).

HAB. The child's self-report of relational intent attributions in response to socially ambiguous situations was assessed in Grades 3 through 5 using a measure of intent attributions, the Assessment of Intent Attributions (Crick, 1995). Based on Crick (1995), this measure involves hypothetical-situation vignettes of socially ambiguous relational and instrumental provocation situations. Children were asked to imagine that the events in the stories were happening to them. Two stories depicted relational provocation focusing on potential rejection (e.g., discovering that a friend is playing with someone else); however, in fifth grade only one story of relational provocation was included. For each story, the child indicated a reason for the provocation with two options indicating hostile intent (coded as 1), such as "Your friend was mad at you," and two indicating benign intent (coded as 0), such as "Your friend didn't see you on the playground." Three stories depicted instrumental provocation focusing on ambiguous intent property destruction and were collected but will not be used in the proposed analyses. The next question asked the child whether the provocative behavior was intended to be mean (1 = *trying to be mean*) or not mean (2 = *not trying to be mean*). Children's responses to each of the two questions across the relational stories were summed across third to sixth grades. Four independent studies (Crick, 1995; Crick et al., 2002; Hoglund & Leadbeater, 2007; Leff et al., 2006) have demonstrated Cronbach α levels ranging from 0.65 to 0.76 for the items assessing hostile intent attributions for relational provocations (these values were only below 0.70 in one study; see also Nelson & Coyne, 2009, for a slightly adapted measure that was reliable). Despite concerns about reliability (see Crain et al., 2005), Leff et al. (2006) reported a 2-week test–retest reliability of 0.79 for relational provocation items. Within the current data set and based on prior research with this sample and the lack of reliability for the fifth-grade assessment that only contained one relational provocation story (Godleski & Ostrov, 2010), a composite score was created from child-report HAB from Grades 3, 4, and 5 by summing the items across these years. In keeping with prior research, the composite was created because the measure of relational provocation has been truncated by the NICHD ECCRN from its original format of five items to two, thus creating low internal consistency. Thus, in all cases the present study used whatever existing stories/items were available in the NICHD data set at the particular time points. The Cronbach α for the composite was 0.76. Interitem correlations were examined to test if there was greater internal consistency for the composite due to item overlap across the years, and this was not the case (rs = .04–.28).

Loneliness and social dissatisfaction questionnaire. Cassidy and Asher's (1992) standard loneliness measure (see also

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Asher, Hymel, & Renshaw, 1984) was used in fifth grade. Children respond to ratings of 16 items (e.g., "Do you have friends at school" and "Do you have others to play with at school") rated on a 1 (*not true about you*) to 3 (*true about you*) scale that includes questions about making friends, playing at school, getting along with classmates, and having friends in their class. Responses across items were summed. This measure has revealed appropriate factor structure (Cassidy & Asher, 1992) and has been shown to discriminate between those children who are rejected by their peers and those who are not, and predicts future anxiety, aggression, and socially withdrawn behavior (Coplan et al., 2007; Prakash & Coplan, 2007). There has been appropriate internal consistency in past research with this measure (e.g., Cronbach αs = 0.79–0.90; Asher et al., 1984; Cassidy & Asher, 1992). This scale is reliable in the current sample (Cronbach $\alpha = 0.91$).

Depressive symptoms. CDI-Short Form (CDI-S; Kovacs, 1992) is a self-report measure of childhood depressive symptoms (e.g., Garber & Flynn, 2001) and was used in fifth grade. The CDI-S consists of 10 items in which children are asked to choose one of three statements that best describes them during the past 2 weeks (e.g., "I am sad once in a while," "I am sad many times," or "I am sad all the time"). Items are scored from 0 to 2, with higher scores indicating greater severity of depressive symptoms. Responses across items were summed. The short form correlates well with the full instrument (i.e., $r = .89$; Kovacs, 1992), which has demonstrated appropriate psychometric properties in the past (e.g., Fristad, Weller, Weller, & Teare, 1991; Kovacs, 1985; Timbremont, Braet, & Dreessen, 2004). This scale is reliable in the current sample (Cronbach $\alpha = 0.73$).

Physical aggression. Teacher report of physically aggressive behavior for the study children was derived from the aggressive behavior subscale of the Teacher Report Form (Achenbach, 1991) in third grade (physical aggression items were not collected as part of the CSBS-TR in the SECCYD). This checklist (a parallel measure to the Child Behavior Checklist) is a widely used measure to assess the social competence and problem behavior of children 4 to 18 years old. From the Teacher Report Form, a series of behaviors (118 items) are rated on 3-point scales from 0 (*not true of the child*) to 2 (*very true of the child*; Achenbach, 1991). There are extensive validity data indicating that clinically referred children receive elevated scores on this measure and that elevated scores are predictive of the onset and continuation of problems (Collett et al., 2003). Five items reflecting physical aggression to people, animals, and objects will be selected, as was done by NICHD ECCRN (2004) and in other recent publications (Godleski & Ostrov, 2010). These items are (a) destroys own things; (b) destroys others' things; (c) gets in many fights; (d) cruel, bully, mean to others; and (e) physically attacks people. Raw scores for the relevant items will be summed. Physical aggression items will be used over more general indices of disruptive or conduct disorder behavior (i.e., lying or stealing) of the aggressive behavior scale to avoid a focus on more deviant, oppositional behavior. Responses across items were summed for the purposes of this study. Physical aggression is often moderately correlated with relational aggression (see Crick, Ostrov, & Kawabata, 2007) and is in the current sample ($r = .47$, $p < .001$), and thus it will be a covariate to explore the unique effects of relational aggression.

Procedures

Of the families who were contacted and met eligibility criteria, 58% agreed to participate in the study (NICHD ECCRN, 1997; further recruitment and selection procedures are described in detail on the study website: http://secc.rti.org). The aggression measures were completed by teachers in the third and sixth grades in the spring semester after having been given questionnaire packets by research staff. Teachers were compensated $50 for their completion of the questionnaire packet. Children came to the laboratory in the third through fifth grades to complete the HAB, loneliness, and depressive symptoms measures. The timing of the laboratory sessions typically occurred during the spring/early summer for most participants. The measures were presented to the children as an interview with a trained interviewer while the children were able to read along in their own copy of the questionnaires and mark their own responses. Parent report of victimization occurred during lab visits. Families received a small payment at the end of the lab/home visit (∼$25 in thank you gifts). At the end of the sixth grade data collection (i.e., Phase III), regardless of complete data or not, families who continued to participate were entitled to $250 cash or a $500 savings bond. Informed consent and assent were obtained.

Missing data

It is well known that missing data is a concern in this longitudinal data set due to attrition and failure to participate in all assessments (e.g., Belsky et al., 2007). Only 291 families (21%) formally withdrew from birth through sixth grade, but most children have some missing data and this is usually teacher ratings rather than direct assessments (Belsky et al., 2007). Recall that those who had missing data (3.4%) on four or more of the key study variables (i.e., more than half of the variables) were a priori removed using listwise deletion because we reasoned it is inappropriate to impute values for the majority of key variables for these few participants. As previously mentioned, another four participants were also removed because two participants were missing gender demographic information and another two were extreme multivariate outliers. Kline (2005) suggests that 5%–10% or less missing data is not large (p. 72). Preliminary analyses suggested that between 3.0% and 10.9% of the data was missing for each of the respective key study variables (including those participants who were a priori removed from the sample): re-

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lational aggression in third grade (teacher report, 10.6% missing), physical aggression in third grade (teacher report, 9.5% missing), relational victimization in sixth grade (teacher report, 3.0% missing), loneliness in fifth grade (self-report, 5.1% missing), CDI-S in fifth grade (self-report, 3.6% missing), and the HAB composite (self-report, 10.9% missing). Analyses suggest no differences on key demographic (i.e., family income) or any of the central study variables. That is, mother report of relational and physical aggression was not significantly different for those with or without teacher report of these variables in third grade.

Analytic plan

The current study has several empirical goals. Prior to testing the formal hypotheses, skew and kurtosis were calculated for all study variables and were <3 for skew and <8 for kurtosis, indicating that the data does not violate the assumption of normality (Kline, 2005). Bivariate correlations were run with age and were not significant, so age will not be a covariate in the analyses. Similarly, correlational analyses were conducted with socioeconomic status and there were no significant associations, so socioeconomic status will not be a covariate in the models. To test the central hypotheses, a series of path analysis models with maximum likelihood estimation using a standard SEM software package (i.e., Mplus 5.1; Muthén & Muthén, 2009) was conducted. The indirect mediational pathways were assessed using the bias-corrected bootstrap method using 1,000 bootstrap draws (Efron & Tibshirani, 1993). In keeping with recommendations of Hu and Bentler (1999), the standardized root mean square residual (SRMR) and the comparative fit index (CFI) were used to evaluate model fit. A cutoff of 0.08 or lower for SRMR and a value of 0.95 or larger for the CFI is viewed as a good fit, and these two fit indices have been found to provide an appropriate balance between Type I and II error rates (Hu & Bentler, 1999). Covariates were entered in the path model and included initial physical aggression and gender.

Results

Data cleaning

According to the guidelines provided by Kline (2005), data were subject to several phases of data cleaning prior to any data analysis. Because the data was missing at random, missing data was imputed with multiple imputation (Rubin, 1987; Schafer & Graham, 2002) using regression procedures to estimate missing values for each of the key study variables. Multivariate outliers were determined using Mahalanobis distances as outlined by Tabachnick and Fidell (2007), and 149 cases of multivariate outliers were truncated to three standard deviations from the mean (Kline, 2005). Then multicollinearity was assessed and was not of concern because none of the variables correlated higher than .53. Finally, the variances of the key variables were rescaled.

Preliminary analyses

Descriptive statistics for and intercorrelations between each of the constructs assessed are presented in Table 1. The correlations between the constructs ranged from low to moderate (*r*s = .03–.54). Relational aggression and relational victimization were significantly correlated at both time points. Further, loneliness in particular was significantly correlated with both relational aggression in Grade 3 and relational victimization in Grades 3 and 6.

Hypothesized models

A structural equation modeling path analysis was conducted using maximum likelihood estimation in MPlus version 5.21 (Muthén & Muthén, 2009). In the first hypothesized model tested (N = 1,035), relational victimization in sixth grade was regressed on each of the mediators (i.e., HAB for relational provocations, loneliness, and depression) as well as relational aggression in third grade and paths between rela-

Table 1. *Descriptive statistics and correlations*

	1	2	3	4	5	6	7	8
1. RAGG TR G3	—							
2. RVICT MR G6	.13***	—						
3. Depression CR G5	.06	.14***	—					
4. Loneliness CR G5	.07*	.23***	.54***	—				
5. HAB CR G3–5	.09**	.03	.11***	.16***	—			
6. PAGG TR G3	.47***	.12**	.07*	.13***	.11***	—		
7. RAGG TR G6	.29***	.20***	.07*	.04	.05	.20***	—	
8. RVICT MR G3	.13***	.43***	.11***	.14***	.03	.18***	.11***	—
M	2.05	1.34	1.63	7.05	4.25	1.11	1.65	1.14
SD	2.24	1.94	2.08	2.22	2.01	1.95	1.86	1.74
Range	0–10.00	0–8.65	0–9.87	4.43–14.96	0–10.00	0–5.15	0–9.00	0–6.92

Note: RAGG, relational aggression; RVICT, relational victimization; HAB, hostile attribution biases; PAGG, physical aggression; TR, teacher report; MR, mother report; CR, child report; G, grade; G3–5, composite of grades 3, 4, and 5.
*p < .05. **p < .01. ***p < .001.

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tional aggression and each of the mediators was also tested (see Figure 1). Two theorized covariates (i.e., physical aggression and gender) were also included. For the tested model, the goodness of fit indices were good, SRMR = 0.027, CFI = 0.966, root mean square error of approximation (RMSEA) = 0.066; χ^2 (6) = 32.77, $p < .001$ (Hu & Bentler, 1999), and thus this model was adopted. Physical aggression was associated with concurrent relational aggression (β = 0.57, $p < .001$) but was not significantly associated with relational victimization (β = 0.06, *ns*). Gender (coded as 1 = boys and 2 = girls) was significantly associated with relational aggression (β = 0.32, $p < .001$) but was not significantly associated with relational victimization (β = 0.10, *ns*).

One thousand bootstrap samples and the 95% bias-corrected confidence intervals (CIs) were used to test the significance of the hypothesized specific indirect effects. In the adopted model, child-reported loneliness was found to partially mediate the relation between relational aggression and relational victimization (β = 0.01, 95% CI = 0.003–0.027). The remaining indirect effects were not significant, because relational aggression was predictive of HAB for relational provocations; however, HAB was not significantly associated with relational victimization, and the indirect effect was not significant (β = –0.001, 95% CI = –0.008 to 0.003). Further, depression was not significantly associated with relational aggression or victimization, and the overall indirect effect of this path was not significant (β = 0.001, 95% CI = –0.003 to 0.008) within the path analysis. Overall in the adopted model, 7% of the variance in relational victimization was accounted for by its predictors.

In the second model, the reverse direction of effects were tested from maternal-reported relational victimization in third grade to teacher-reported relational aggression in sixth grade (N = 1,030). Relational aggression was regressed on each of the mediators (i.e., HAB for relational provocations, loneliness, and depression) as well as relational victimization, and paths between relational victimization and each of the mediators was also tested (see Figure 2). In keeping with the first model, the two theorized covariates (i.e., physical aggression and gender) were also included. For the tested model, the goodness of fit indices were good, SRMR = 0.031, CFI = 0.942, RMSEA = 0.069; χ^2 (6) = 35.25, $p < .001$ (Hu & Bentler, 1999), and thus this model was adopted. Physical aggression was associated with concurrent relational victimization (β = 0.18, $p < .001$) and with relational aggression in sixth grade (β = 0.20, $p < .001$). Gender was not significantly associated with relational victimization in third grade (β = 0.04, *ns*) but was significantly associated with relational aggression in sixth grade (β = 0.09, $p < .01$).

One thousand bootstrap samples and the 95% bias-corrected CIs were used to test the significance of the hypothesized specific indirect effects. The indirect effects were not significant, because relational victimization in third grade was predictive of loneliness; however, loneliness was not significantly associated with relational aggression in sixth grade and the indirect effect was not significant (β = –0.003, 95% CI = –0.014 to 0.007). Further, depression was significantly associated with relational victimization in third grade but not relational aggression in sixth grade, and the overall indirect effect of this path was not significant (β = 0.006, 95% CI = –0.002 to 0.020) within the path analysis. Finally, HAB for relational provocations was not significantly associated with either relational victimization or relational aggression, and the overall indirect effect of this path was not significant (β = 0.001, 95% CI = –0.001 to 0.006) within the path analysis. Overall, in the adopted model, 6% of the variance in relational aggression was accounted for by its predictors.

Discussion

There were several goals of the current study. First, we predicted a direct prospective link between relational aggression and relational victimization. We anticipated that this direct

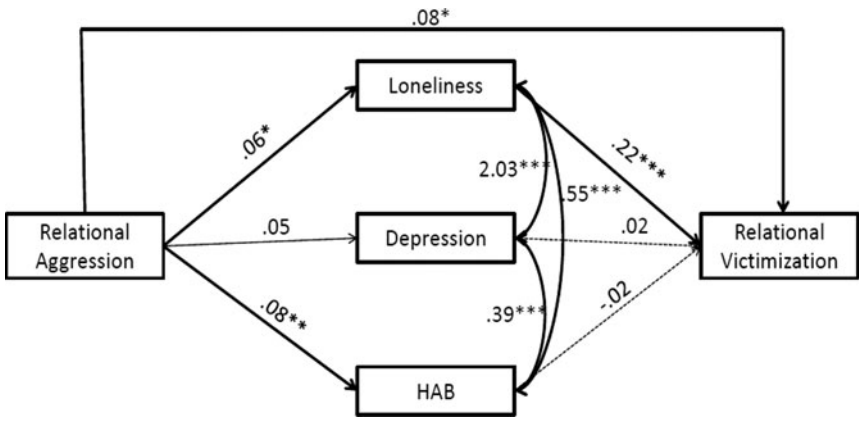

Figure 1. The final adopted model testing the direct and indirect paths between relational aggression in third grade and relational victimization in sixth grade. Relational aggression is teacher reported. Loneliness, depressive symptoms, and hostile attribution biases (HAB; for relational provocations) are child reported. Loneliness and depressive symptoms are from fifth grade. HAB is based on a composite from third to fifth grades. Relational victimization is from maternal report. Unstandardized path coefficients are presented. Physical aggression from third grade teacher report and gender were added as covariates (see text) and are not presented for ease of communication. Thick lines are significant, thin lines are nonsignificant trends ($p < .06$), and dotted lines are not significant. *$p < .05$. **$p < .01$. ***$p < .001$.

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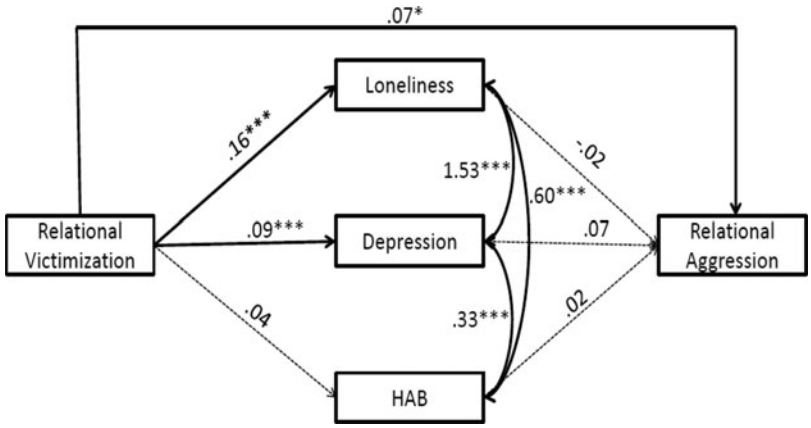

Figure 2. The final adopted model testing the direct and indirect paths between relational victimization in third grade and relational aggression in sixth grade. Relational victimization is from maternal report. Loneliness, depressive symptoms, and hostile attribution biases (HAB; for relational provocations) are child reported. Loneliness and depressive symptoms are from fifth grade. HAB is based on a composite from third to fifth grades. Relational aggression is from teacher report. Unstandardized path coefficients are presented. Physical aggression from third grade teacher report and gender were added as covariates (see text) and are not presented for ease of communication. Thick lines are significant, and dotted lines are not significant. *$p < .05$. **$p < .001$.

path would be statistically significant even after controlling for physical aggression and gender. Second, we predicted an indirect association between relational aggression and future relational victimization, such that loneliness, HAB for relational provocations, and depressive symptoms would each uniquely mediate the direct path. We found overall support for our first hypothesis. That is, we documented that relational aggression was directly associated with future relational victimization, even after controlling for initial physical aggression and gender during middle childhood. We revealed some support for our second hypothesis testing the indirect pathway of the social process model. That is, we found that loneliness mediated the prospective association between relational aggression and relational victimization. However, the findings were not confirmed for HAB for relational provocations or for depressive symptoms. In keeping with predictions, relational aggression was significantly associated with HAB for relational provocations. Despite these findings, we did not find subsequent statistical support for the link between the mediator (HAB) and the outcome variable (relational victimization). Correlations indicate that HAB for relational provocations was significantly associated with both loneliness and depressive symptoms. Third, depressive symptoms were not associated with either the predictor (relational aggression) or the outcome (relational victimization). Correlations indicated that depressive symptoms were associated with both of the other potential mediators. These findings suggesting that the mediators were associated are generally consistent with prior literature and support the validity of these constructs in the present study. That is, loneliness and depression are often found to be associated for both boys and girls in middle childhood and adolescence (e.g., Kochenderfer-Ladd & Skinner, 2002; Prinstein & La Greca, 2002). In addition, depression and HAB for relational provocations have been significantly associated concurrently (Hoglund & Leadbeater, 2007; cf. Prinstein, Cheah, & Guyer, 2005). However, it is possible that the moderate intercorrelations between some of these mediators (e.g., loneliness and depressive symptoms) may have attenuated the hypothesized effects. Our path model controls for the influence of all these variables simultaneously and thus yields a conservative estimate of these prospective links, and it is conceivable that individual mediation models would have yielded predicted significant effects but with the risk of greater Type I error. Fourth, the predictors in the model accounted for only 7% of the variance in relational victimization, and future research should build on the current study by including other theorized predictors to improve the magnitude of these effects.

Given the extant theory, the present study emphasized one possible direction of effect (i.e., from aggression to peer victimization). However, recent work suggests that via social learning processes, the reverse direction of effect may also be supported (i.e., children who are victimized learn from these experiences and are more prone to display aggression with peers in the future; Hanish & Guerra, 2000; Ostrov, 2010). The alternative direction of effect was therefore tested and supported. That is, as hypothesized, the direct effect from peer victimization to aggression, which was supported by theory and past findings (Rose & Rudolph, 2006; Yeung & Leadbeater, 2007), was confirmed in the present longitudinal study. Thus, the present study adds to the growing evidence that supports the theoretical notion, with regard to the direct association between aggression and peer victimization, that *both* directions of effect are present and account for developmental changes in peer relations. The alternative model accounted for nearly the same amount of variance (i.e., 6%) as the original hypothesized model, and therefore the present findings underscore the importance of testing dynamic bidi-

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rectional associations between aggression and peer victimization in future research. However, the three indirect effects in the alternative model and in particular those via HAB that were hypothesized were not supported, despite past theory that suggests this developmental pathway (e.g., Rosen, Milich, & Harris, 2007). It is conceivable that the methodological limitations associated with the assessment of HAB in the current data set limited our ability to detect these potential pathways, and future work is needed to further test these social process models. Similar to the first model, it is also possible that the high degree of association among the three mediators in our conservative statistical model constrained our ability to test these unique indirect effects. It is also conceivable that other developmentally related constructs such as peer rejection or negative friendship quality might mediate the paths from relational victimization to relational aggression, and future research will benefit from testing additional alternative models. The alternative model also shows prospective associations between relational victimization and both loneliness and depressive symptoms, which adds to the extant developmental psychopathology literature by showing the negative outcomes associated prospectively with relational victimization during this and later developmental periods (e.g., Desjardins & Leadbeater, 2011; Nixon, Linkie, Coleman, & Fitch, 2011; Prinstein et al., 2005; Sullivan et al., 2006).

The current findings have clear implications for theory, and the study contributes novel information to the extant developmental literature. Specifically, this is the first evidence supporting both direct and indirect pathways of the social process model of peer harassment in middle childhood for relational aggression and victimization. The findings indicate that relational aggression is uniquely (controlling for physical aggression) associated with future relational victimization and that relational victimization predicts future relational aggression. However, there is also evidence for an indirect prospective pathway, and this pathway suggests a possible mechanism by which aggressors become victims. That is, relational aggressors increase in feelings of loneliness over time and in turn are potentially an easier target for future peer harassment and victimization because they do not have others to protect them from this harm (Bierman, 2004; Hodges & Perry, 1999). Given the overlap between peer rejection and loneliness documented in the literature (e.g., Asher & Wheeler, 1985) these findings and interpretation are in keeping with recent studies that have found that relational aggressors also become future victims via peer rejection during early childhood (Ostrov, 2008). Therefore, the present findings support both the direct and indirect components of the social process model of peer harassment, which has previously been tested and supported in middle childhood but only for physical subtypes of aggression and peer victimization (Boivin & Hymel, 1997; Boivin et al., 2001).

We had anticipated that both HAB for relational provocations and depressive symptoms would also mediate the prospective association between relational aggression and peer victimization (as well as between relational victimization and relational aggression), but these hypotheses were not supported. In keeping with past research and theory, HAB was associated with initial relational aggression, which further underscores the importance of studying the link between relational aggression and social cognitions like HAB (see Ostrov & Godleski, 2010). These findings lend some important prospective support to the notion that relational aggression is associated with HAB for relational provocations, which is not always found in the developmental literature (Crain et al., 2005; Nelson et al., 2008; cf. Bailey & Ostrov, 2008; Crick et al., 2002).

Limitations and future directions

We believe our study has a number of strengths, which include theoretically informed hypotheses, a multi-informant (i.e., teacher, child, and parent) and multimeasure longitudinal design, and use of sophisticated SEM path models. Despite these and other strengths, there are some important methodological limitations that our secondary analysis could not overcome. First, although the study was designed to represent typically developing children from various geographic regions of the United States, it was not a nationally representative study, and as such our findings may not generalize to all children in middle childhood. Future work is needed with a more ethnically and socioeconomically diverse sample, and additional contexts (i.e., after school programs, neighborhood community centers, and summer campus) and samples (e.g., at risk, clinic referred, and detained) should be considered. Second, due to changes to the original measure (i.e., reduction in the number of vignettes), we relied on an assessment strategy that has been previously published with this data set (i.e., an internally consistent composite of HAB was created across third to fifth grades; Godleski & Ostrov, 2010). Thus, there was some overlap in time between the assessment of teacher-reported relational aggression/mother-reported relational victimization (i.e., third grade) and child-reported HAB for relational provocations (i.e., third through fifth grades), and future developmental research should test models in which there is no temporal overlap between the predictor and mediator variables (Selig & Preacher, 2009). In addition, it is conceivable that the present use of the truncated measure of HAB and resulting composite may have reduced the likelihood of finding associations with relational victimization, and future research is needed with the full measure and better psychometric properties. Third, we used valid and reliable teacher reports and parent reports, and there is an extensive history for using these instruments in this developmental period; however, replication with other assessments such as peer reports (Prinstein & Cillessen, 2003), structured interviews (e.g., Tackett, Waldman, & Lahey, 2009), laboratory/observational paradigms (e.g., Banny et al., 2011), and the inclusion of physiological methods (Murray-Close, Han, Cicchetti, Crick, & Rogosch, 2008) is called for in future replication and extension studies. Fourth, the magnitude of the effects for the present models were small (i.e., accounting

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for only 6%–7% of the variance), and comparisons to prior literature are difficult given differences in the selected models, methodologies, and developmental periods. The present findings are smaller than other studies that included similar constructs and analytic approaches (e.g., Hoglund & Leadbeater, 2007), and the present findings must be replicated. However, it is not uncommon to find small amounts of variance accounted for in studies of relational aggression or victimization (e.g., Crick & Bigbee, 1998; Ostrov, 2008; Sullivan et al., 2006), and we believe that they are meaningful because these effects are evident over several years and using independent informants in the present longitudinal study.

The extent to which the children in the study were aggressive victims or provocative victims (i.e., high on both aggression and victimization; see Schwartz et al., 2001) was not assessed, and future work should more carefully examine how the present pathways may be different for these children compared to passive victims or nonaggressive victims (see Schwartz, 2000). Given recent attention to the functions of aggression (Card & Little, 2006), future work should examine how the present model holds for both proactive (i.e., goal oriented and instrumental) and reactive (i.e., retaliatory, impulsive, and hostile) aggression. The current study did not include assessments of positive peer relationships or social competence, and a more balanced approach with respect to nonphysical forms of aggression has been called for in the literature (Heilbron & Prinstein, 2008; Xie, Swift, Cairns, & Cairns, 2002). It is certainly anticipated that relational aggression predicts positive friendship quality in some developmental contexts (e.g., Banny et al., 2011; Murray-Close et al., 2007; Rose et al., 2004), and the associated relationship provisions might serve as a protective factor against future peer victimization (see Schmidt & Bagwell, 2007). Thus, the inclusion of social competence mechanisms should be tested in future social process models. Recent empirical work during middle childhood supporting a relational vulnerability model suggests that the links between relational aggression and HAB for relational provocations may be moderated by relational victimization and emotional distress (Mathieson et al., 2011). Future developmental models will need to have a greater appreciation for the role of various theorized moderators (e.g., culture; Kawabata et al., 2010).

Conclusions

The present secondary analyses of the SECCYD data set will advance the scientific literature in three important ways. First, this study contributes to the growing literature on the development of both relational aggression and victimization using a large prospective sample. Second, the study revealed theoretically driven mechanisms by which relational aggression and victimization are associated across time and during middle childhood. Moreover, the findings lend novel support to the social process model for the study of relational subtypes of aggression and victimization during this developmental period. Third, the present findings have clear implications for informing the development of prevention and intervention efforts for aggression and peer victimization. Improving peer relationships through intervention programs could include reducing relationally aggressive behavior and providing coping mechanisms for relational victimization. In particular, the social process model highlights possible mechanisms for intervention efforts, and specifically targeting loneliness in intervention programs may be an important area for future work. That is, the present evidence suggests that programs should focus on reducing aggressive behavior and promoting skills for friendship building and maintenance (e.g., Leff et al., 2009; Webster-Stratton & Reid, 2003) but should also target skills for reducing peer victimization (e.g., Leadbeater, Hoglund, & Woods, 2003) as well as coping with loneliness. Reducing peer victimization may help alleviate potential feelings of loneliness and in turn avoid setting the children on a maladaptive pathway marked by social–psychological adjustment problems and future psychopathology.

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