

Can Relational Aggression and Victimization Help to Explain the Emergence of  
the Sex Difference in Depression During Adolescence?

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### **Abstract**

The current study investigated the contributions of relational aggression and victimization to the sex difference in adolescent depressive symptoms. In addition, pubertal development and both rumination and co-rumination were examined as potential contributing factors. A total of 499 sixth, seventh, and eighth grade students and their teachers participated in the current study. Relational aggression and victimization were assessed by teacher-reports, and all other constructs were measured by self-reports. Surprisingly, no sex differences in depressive symptoms were found. Relational aggression was associated with depressive symptoms, but only when rumination about victimization experiences was high. Relational victimization was associated with depressive symptoms, and this association was partially mediated by rumination about victimization experiences. Neither pubertal status nor timing interacted with relational aggression or victimization to predict depressive symptoms. Therefore, rumination about victimization experiences appears to play an important role in the associations between relational aggression and depressive symptoms and between relational victimization and depressive symptoms. The practical implications of these findings are discussed and recommendations are offered for future research.

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## Introduction

Depression is a serious illness that, according to the World Health Organization, affects 121 million people worldwide and is one of the leading causes of disability (WHO, 2008). Depression is associated with a number of negative consequences, including suicide. Furthermore, there is a substantial negative impact of depression on individuals and families, as well as a large financial burden on society (Pincus & Pettit, 2001). Therefore, there is a strong need to better understand depression in order to assist with prevention and treatment efforts.

Research generally shows that prior to the onset of adolescence, there are either no sex differences, or boys have a slightly higher rate than girls (Twenge & Nolen-Hoeksema, 2002). At about age 12 to 13 years, a sex difference emerges in which girls' rates increase while boys' rates remain stable or do not increase as rapidly, and by late adolescence girls are twice as likely as boys to be depressed (Nolen-Hoeksema & Hilt, 2009). Several factors have been explored in an attempt to understand why this sex difference emerges, including cognitive styles (e.g., girls' tendency to ruminate about negative events), pubertal change, body dissatisfaction, and environmental factors, such as sexual abuse. No one factor has been found to account for the sex difference, and the gap may emerge from an interaction between risk factors and the challenges of adolescence (Hilt & Nolen-Hoeksema, 2009; Nolen-Hoeksema & Girgus, 1994; Nolen-Hoeksema & Hilt, 2009).

However, many of the factors studied to date are individual in nature. In contrast, many developmental psychopathologists have suggested a need to move beyond

individual factors to consider interpersonal relationships in the development of psychopathology, including depression, particularly for girls (Crick & Zahn-Waxler, 2003; Leadbeater, Blatt, & Quinlan, 1995; Rose & Rudolph, 2006; Rudolph, 2002, 2009). For example, Rudolph (2002) proposes that it is important to consider girls' interpersonal vulnerability in the development of internalizing problems. Furthermore, Crick and Zahn-Waxler (2003) suggest that relational problems may be more strongly associated with the development of psychopathology for girls than for boys.

In fact, research findings suggest that stressful life events may explain part of the sex difference in depression (e.g., Ge, Lorenz, Conger, Elder Jr., & Simons, 1994), and other findings suggest that many of the stressful life events preceding depression in adolescents are specifically interpersonal in nature (Cyranowski, Frank, Young, & Shear, 2000), which may include incidents of relational aggression and/or victimization. Furthermore, research suggests that girls experience more interpersonal stress than boys (Wagner & Compas, 1990) and that girls find stressful interpersonal events more distressing than boys (Cross & Madsen, 1997; Gavin & Furman, 1989; Leadbeater et al., 1995). For example, in a sample of adolescents, Shih, Eberhart, Hammen, and Brennan (2006) found that girls reported experiencing more episodic interpersonal stress, which helped to explain the sex difference in depression. Furthermore, girls were more likely to report experiencing depression in response to interpersonal stress. Similarly, Hankin, Mermelstein, and Roesch (2007) found that adolescent girls experienced more stressors (particularly related to peers) than boys, and girls also reacted more strongly to stressors with depression than did boys. Therefore, it seems appropriate to move beyond solely

individual factors to examine relational factors in the study of the sex difference in depression.

### **Relational Aggression and Victimization**

One specific area of interpersonal factors that has largely been ignored in discussions of the explanation of the sex difference in depression is relational aggression and victimization<sup>1</sup>. In recent reviews of the literature on the emergence of the sex difference during adolescence, interpersonal factors are discussed, but the focus is on interpersonal orientation and interpersonal stress more generally (Hilt & Nolen-Hoeksema, 2009; Nolen-Hoeksema & Hilt, 2009). Similarly, in her conceptualization of an interpersonal model of depression, Rudolph (2009) focuses on a number of interpersonal domains, such as problematic appraisals of relationships, social-behavioral deficits, and relationship disturbances and how these interact with sex and the challenges of adolescence in the development of depression. She briefly mentions victimization but does not discuss aggression in any part of the model. However, she does discuss how research needs to move beyond looking at adolescents' reactions to the social world to exploring how they are active in their social worlds, including selecting and contributing to social experiences. Finally, in their seminal review of factors that may explain the emergence of the sex difference in depression during adolescence, Nolen-Hoeksema and Girgus (1994) dismiss aggression as a relevant factor because aggression is shown to be

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<sup>1</sup> Relational aggression is similar to indirect aggression, in which aggression is carried out behind another's back (see Björkqvist, 1994 for a detailed description of indirect aggression) and social aggression, which involves damaging someone's social standing but includes nonverbal behaviors as well (Galen & Underwood, 1997). Although they are related, the constructs are conceptually distinct (Crick, Werner et al., 1999). The current paper focuses on relational aggression and victimization, but when there are relevant findings on these related constructs, these will be discussed as well.

more prevalent in males. In the past, aggression and victimization were mainly studied in boys because only physical forms were examined. However, more recent work has identified a type of aggression that is more salient for girls: relational aggression.

Relational aggression occurs when the relationship is used as the vehicle for harm, such as when one manipulates relationships, threatens to damage relationships, or both (Crick & Grotpeter, 1995). This includes behaviors such as excluding, ignoring, and spreading rumors. Relational victimization occurs when one is victimized through relationally aggressive behaviors (Crick & Grotpeter, 1996).

Although some studies of relational aggression, as well as indirect and social aggression, have found that girls are more relationally aggressive than boys in adolescence, many have not found an effect (e.g., Fite, Stauffacher, Ostrov, & Colder, 2008; Prinstein, Boergers, & Vernberg, 2001), and others have found that boys are more relationally aggressive (Albrecht, Galambos, & Jansson, 2007; Little, Jones, Henrich, & Hawley, 2003). In a recent meta-analysis, Card, Stucky, Sawalani, and Little (2008)<sup>2</sup> found a significant but very small overall sex difference in relational aggression, favoring girls. What does appear to be the case, however, is that girls are more likely to engage in relational aggression than physical aggression, and failing to include relational aggression in studies would exclude a number of girls who engage in aggression (Crick & Grotpeter, 1995).

Similarly, with respect to being the recipient of relational victimization in

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<sup>2</sup> This meta-analysis examined relational, social, and indirect aggression, which, as mentioned above, are all related but distinct constructs. For ease of reading, it will be from here on referred to as a review of relational aggression (rather than mentioning all three constructs each time). It is noted that the results of the meta-analysis should be interpreted with caution, as indirect and social aggression, as previously mentioned, are not equivalent to relational aggression.

adolescence, some studies have shown higher levels in girls (e.g., Schafer, Werner, & Crick, 2002), but many have found either no sex difference (Hoglund & Leadbeater, 2007; Prinstein et al., 2001; Storch, Crisp, Roberti, Bagner, & Masia-Warner, 2005; Sullivan, Farrell, & Kliewer, 2006), or a higher prevalence in boys (La Greca & Harrison, 2005; Leadbeater, Boone, Sangster, & Mathieson, 2006).

Whereas sex differences in prevalence may not always be evident, there are many other reasons to believe that relational aggression and victimization may be important factors to consider in understanding the emergence of the sex difference in depression during adolescence.

First, there is a substantial body of literature showing that relational aggression and victimization are associated with depression. For example, some studies have shown that relational aggression is associated with internalizing problems more generally (e.g., Crick, 1997; Murray-Close & Crick, 2007). Meta-analytic findings have shown that relational aggression is more strongly associated with internalizing outcomes than is physical aggression (Card et al., 2008). Studies that have examined depression specifically have established a link between relational aggression and depression in school-aged children (Crick & Grotpeter, 1995; Kawabata, Crick, & Hamaguchi, 2010; Zimmer-Gembeck, Hunter, & Pronk, 2007), adolescents (Ellis, Crooks, & Wolfe, 2009; Herrenkohl, Catalano, Hemphill, & Toumbourou, 2009), and young adults (Kolbert, Field, Crothers, & Schreiber, 2010). Furthermore, some studies have shown that the association is specific to girls (Storch, Bagner, Geffken, & Baumeister, 2004).

Although fewer studies have focused specifically on relational victimization, there

is research to suggest an association between this type of victimization and internalizing outcomes more generally (e.g., Crick, Casas, & Ku, 1999; Cullerton-Sen & Crick, 2005; Hoglund, 2007). More specifically, an association has also been established between relational victimization and depression in children (Bauman, 2008; Buhs, McGinley, & Toland, 2010; Cole, Maxwell, Dukewich, & R., 2010; Putallaz et al., 2007; Schwartz, Gorman, Nakamoto, & Toblin, 2005; Uhrlass, Crossett, & Gibb, 2008), adolescents (Cole et al., 2010; Hoglund & Leadbeater, 2007; La Greca & Harrison, 2005; Leadbeater et al., 2006; Prinstein et al., 2001) and young adults (Dempsey & Storch, 2008; Gomes, Davis, Baker, & Servonsky, 2009); however, there have been exceptions where no association was found (Craig, 1998; Khatri, Kupersmidt, & Patterson, 2000; Storch, Zelman, Sweeney, Danner, & Dove, 2002). Similar to findings from relational aggression, some studies have found that the association between relational victimization and depression is specific to girls (Prinstein et al., 2001; Storch, Nock, Masia-Warner, & Barlas, 2003). Therefore, there is substantial evidence that both relational aggression and victimization are associated with depression, and there is some limited evidence to suggest that these associations may be stronger in girls.

Second, the meaning of relational aggression appears to differ for boys and girls. Research shows that girls find relational acts more distressing, hurtful, harmful, wrong and/or unacceptable than boys in preschool (Giles & Heyman, 2005; Goldstein, Tisak, & Boxer, 2002), school-aged children (Crick, 1995; Crick, Bigbee, & Howes, 1996; Galen & Underwood, 1997; Giles & Heyman, 2005; Murray-Close & Crick, 2007; Waasdorp, Bagdi, & Bradshaw, 2010) and in adolescence (Coyne, Archer, & Eslea, 2006; Galen &



Underwood, 1997; Goldstein & Tisak, 2010; Paquette & Underwood, 1999).

Third, relational aggression and victimization, and the accompanying distress, may become particularly salient during adolescence, given the changing nature of peer relationships during this developmental period. Although there has been a lack of longitudinal studies, there is some limited evidence to suggest that relational aggression and victimization may increase in adolescence, and this may or may not apply only to girls (Cairns, Cairns, Neckerman, Ferguson, & Garipey, 1989; Owens & MacMullin, 1995; Xie, Farmer, & Cairns, 2003). Interestingly, Werner and Hill (2010) assessed normative beliefs about aggression and found that approval for one's own use of relational aggression increased over the transition to middle school. Regardless of whether the prevalence increases, there are a number of reasons why these behaviors might become more salient for adolescents.

First, peers become very important during adolescence. Adolescents spend more time with peers and place relatively more importance on their peer relationships than younger children (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006). Given the increased importance of peer relationships during this period, it makes sense that relational aggression may be used with increasing frequency to manipulate these relationships. At the same time that peers are becoming so important, adolescents become more cognitively and socially advanced, thus making them better able to manipulate peer relationships (see discussion in Crick & Rose, 2000).

In addition, relational aggression may increase in adolescence because it is a "safer" option (in terms of consequences) than physical aggression, which is associated

with increasingly serious consequences during adolescence (Cairns et al., 1989). In support of this view, studies of adolescents have shown that relational aggression and victimization are more prevalent than overt aggression and victimization, respectively (e.g., Prinstein et al., 2001).

Another reason why relational aggression and victimization may be particularly relevant during adolescence is due to the changing nature of friendships during adolescence. Adolescents' friendships are characterized by higher intimacy and more self-disclosure than younger children's friendships (Buhrmester & Prager, 1995; Parker et al., 2006), and intimacy/self-disclosure provides more "ammunition" for relational aggression (Crick & Rose, 2000). In addition, others have suggested that female friendships in adolescence are characterized by higher disclosure and intimacy than males (see review in Rudolph, 2002), which may relate to higher relational aggression and victimization for girls. For example, Murray-Close et al. (2007) found that increases in intimate disclosure from 4<sup>th</sup> to 5<sup>th</sup> grade were associated with increases in relational aggression for girls only. Similarly, Grotjeter and Crick (1996) found that relationally aggressive children's friendships were characterized by particularly high levels of intimacy.

### **Interactive Models of the Emergence of the Sex Difference in Depression**

Nolen-Hoeksema (2001) points out that after numerous studies of multiple variables, no one factor has been found that fully explains the sex difference in depression. Instead, it is likely the interaction of multiple factors that best explains the sex difference in depression (Hilt & Nolen-Hoeksema, 2009). This is consistent with a

developmental psychopathology perspective on depression, which posits that it is important to consider the interaction of multiple factors across multiple levels in the development of psychopathology (Cicchetti & Toth, 2009). Therefore, relational aggression and victimization may interact with other factors to help explain the sex difference in depression.

Two factors that appear relevant to adolescents and have been explored as factors that contribute to the sex difference in adolescent depression are puberty and rumination/co-rumination. Each of these will be explored as factors that may interact with relational aggression and victimization.

**Pubertal development.** Pubertal timing and status have been selected as variables of interest because (a) they have been shown to relate to depression, especially for girls, and (b) there is some evidence to suggest that they may interact with negative interpersonal events, including victimization, to predict depression (see Rudolph, 2009). Furthermore, Rudolph (2009) argues that research is needed that looks at specific interpersonal vulnerabilities that interact with puberty to confer risk for depression in adolescents.

Pubertal status, which is one's level of pubertal development regardless of age, has been shown to be associated with depression (Angold & Costello, 2006). In particular, some studies have found effects of pubertal status on depression for girls, generally suggesting post-menarcheal girls have elevated levels of depression (e.g., Angold, Costello, & Worthman, 1998; Hayward, Gotlib, Schraedley, & Litt, 1999; O'Dea & Abraham, 1999; Patton et al., 2008; Vogt Yuan, 2007), whereas other studies have not

found an effect (e.g., Angold & Rutter, 1992; Laitinen-Krispijn, van der Ende, & Verhulst, 1999).

In addition to looking at pubertal status, a large body of literature suggests that it is the *timing* of pubertal change that is relevant to understanding depression. There is a large body of research suggesting that early pubertal timing is associated with higher levels of depression for girls (Conley & Rudolph, 2009; Ge, Conger, & Elder Jr., 1996, 2001; Graber, Brooks-Gunn, & Warren, 2006; Hayward et al., 1997; Mendle, Harden, Brooks-Gunn, & Graber, 2010; Negri, Fung, & Trickett, 2008; Rierdan & Koff, 1991; Rudolph & Troop-Gordon, 2010; Siegel, Yancey, Aneshensel, & Schuler, 1999; Stattin & Magnusson, 1990; Stice & Bearman, 2001). Findings for boys have been mixed, with some showing early timing is associated with depression (Alasker, 1992; Ge, Brody, Conger, & Simons, 2006; Lam et al., 2004; Mendle et al., 2010; Negri et al., 2008; Rudolph & Troop-Gordon, 2010), whereas others find that late timing is a risk factor for depression in boys (Conley & Rudolph, 2009; Siegel et al., 1999) or that both early and late timing are risk factors for boys (Kaltiala-Heino, Kosunen, & Rimpela, 2003).

Researchers have explored whether or not puberty may interact with contextual factors to confer risk for depression. Rudolph and Troop-Gordon (2010) propose that contextual factors, such as interpersonal stressors, may amplify the negative effects of early maturation. Whereas not all negative life events are interpersonal in nature, Cyranowski et al. (2000) examined the negative life events experienced by adolescents six months prior to onset of depression and found that 95% were considered to be interpersonal in nature.

There is some evidence to suggest that both early pubertal timing and status may interact with stressful life events, including interpersonal stress, to predict depression, particularly for girls. For example, research has shown that the association between stressful life events and depressive symptoms may be stronger in girls who experience early pubertal timing (Ge et al., 2001) or advanced pubertal status (Silberg et al., 1999). Furthermore, in a study of 5<sup>th</sup> and 6<sup>th</sup> graders, Rudolph and Flynn (2007) found that interpersonal stress was related to depression in pubertal girls, but not for pubertal boys or prepubertal boys and girls. Finally, Conley and Rudolph (2009) found that early pubertal timing for girls and late pubertal timing for boys were associated with depression, but only when peer stress was also high. Rudolph (2009) suggests that the challenges of puberty (e.g., early pubertal timing for girls) may amplify pre-existing relational vulnerabilities to confer risk for depression in adolescents.

A few studies have looked specifically at the interaction of puberty with victimization in predicting depression. For example, in a study of 6<sup>th</sup> graders, Nadeem and Graham (2005) found that the association between peer victimization and depression was stronger for early maturing girls and boys. Furthermore, Compian, Gowen, and Hayward (2009) found that relational victimization was associated with depressive symptoms in girls who had more advanced pubertal status than those who were less physically mature. Therefore, there is evidence to suggest that puberty (both timing and status) may interact with interpersonal stress, including victimization, to confer risk for depression during adolescence.

**Rumination and co-rumination.** Two factors that may also be important to

consider in the associations between relational aggression and depression and relational victimization and depression are rumination and co-rumination. These constructs were chosen because there is some evidence that these behaviors also increase during adolescence, are particularly prevalent in girls, and have been shown to be associated with depression. Furthermore, conceptually, there may be a link between engaging in relational aggression or experiencing victimization and engaging in either rumination or co-rumination.

Rumination is defined as “passively and repetitively focusing on one’s symptoms of distress” (Nolen-Hoeksema, Larson, & Grayson, 1999, p. 1062). Meta-analytic findings demonstrate that rumination is associated with concurrent and future depression in adolescents and that adolescent girls engage in rumination more than adolescent boys (Rood, Roelofs, Bögels, Nolen-Hoeksema, & Schouten, 2009). Furthermore, some researchers have found support for the idea that rumination may help to explain the sex difference in adolescent depression (Hankin, 2008; Hilt, McLaughlin, & Nolen-Hoeksema, 2010; Jose & Brown, 2008; Li, DiGiuseppe, & Froh, 2006). In addition, there is evidence to suggest that rumination may increase during early adolescence, particularly for girls (Jose & Brown, 2008).

Co-rumination is a related construct that is also of interest. Rose (2002) defines co-rumination as “extensively discussing and revisiting problems, speculating about problems, and focusing on negative feelings” (p. 1830), and it is often studied in the context of friendships. Rose found that girls reported more co-rumination than boys, and adolescent girls showed higher rates of co-rumination than younger girls. In addition, she

found that co-rumination mediated the effect of sex on internalizing symptoms. Others have demonstrated that co-rumination is associated with both concurrent depression in adolescent girls (Starr & Davila, 2009) and with a history of childhood depression in a sample of early adolescents (Stone, Urhlass, & Gibb, 2010). Furthermore, Rose, Carlson, and Waller (2007) found that co-rumination predicted future increases in depression in girls but not boys. Interestingly, in a sample of college students, Calmes and Roberts (2008) found that co-rumination with a friend mediated the sex difference in depression, but this effect disappeared when rumination was controlled for. Finally, Hankin, Stone, and Wright (2010) examined co-rumination and depression in adolescents across a four-month period. They found that co-rumination predicted trajectories of depression, which was partially mediated by the generation of interpersonal-dependent stress (i.e., stress in interpersonal domains to which the individual could have contributed). Interestingly, they did not find that sex moderated this association.

Although there is limited research looking at this question, it is plausible that either ruminating alone or co-ruminating with a friend, specifically about negative interpersonal events such as relational victimization, may be important to consider in conjunction with relational aggression and victimization. Rumination and co-rumination could potentially function as moderators, interacting with relational aggression and victimization to confer risk for depression. That is, the association between relational aggression/victimization and depression may be higher in adolescents who also have a tendency to ruminate alone or co-ruminate with a friend about their victimization experiences. Rudolph (2009) proposes that the interplay between regulatory problems,

including rumination and co-rumination, and interpersonal problems may confer risk for depression. For example, although not specifically focusing on aggression or victimization, Marks, Sobanski, and Hine (2010) found that the association between life hassles (which included interpersonal stress) and depression was stronger for those adolescents who ruminated.

Alternatively, rumination and co-rumination could also function as mediators, such that relational aggression/victimization may lead to rumination or co-rumination, which may then lead to symptoms of depression. For example, a girl who is relationally victimized might ruminate alone or co-ruminate with a friend about her victimization experience, which may lead to further feelings of distress and, ultimately, depression. Relationally aggressive individuals may also ruminate or co-ruminate about victimization experiences or about relationally aggressive acts they've been involved in (for example, if an act of relational aggression ended a friendship, the individual may ruminate about this, which may be associated with depression).

There is some support for rumination as a mediator between relational victimization and depression. For example, McLaughlin, Hatzenbuehler, and Hilt (2009) found that emotion dysregulation (which included rumination) mediated the association between relational victimization and internalizing problems in a sample of early adolescents. Furthermore, in a study of urban, low-income, primarily African American children, Waasdorp and colleagues (2010) found that both boys and girls reported that they would use rumination as a strategy for coping with relational victimization. Therefore, both rumination and co-rumination may be important factors to consider in



conjunction with relational aggression and victimization in understanding the sex difference in depression.

### **The Current Study**

There were three specific goals of the study. The first goal was to examine the associations between relational aggression and depressive symptoms and relational victimization and depression. Two hypotheses were explored. The first was that both relational aggression and victimization would be more strongly associated with depressive symptoms for girls than for boys. Furthermore, given the evidence that individuals who are both aggressive and victimized may be at particular risk for depression (e.g., Espelage & Holt, 2007; Leadbeater et al., 2006), it was hypothesized that the interaction of relational aggression and victimization would place girls at particular risk for depressive symptoms.

The second goal was to explore how relational aggression and victimization may interact with other factors to confer risk of depression for girls. Given the previously discussed findings that pubertal status/timing may interact with stressful life events, which are often interpersonal in nature, it was hypothesized that either early pubertal timing, pubertal status, or both would interact with relational aggression and victimization to predict depression, particularly for girls.

Two additional potential factors to consider in conjunction with relational aggression and victimization are rumination and co-rumination. The current study focused on ruminating/co-ruminating about interpersonal stress, specifically relational victimization experiences. It was hypothesized that relational aggression and

victimization would interact with rumination and co-rumination to predict depression, particularly for girls. Furthermore, given that, conceptually, rumination and co-rumination could also function as mediators of the association between relational aggression and victimization with depression, these factors were also examined as such.

Finally, the aforementioned goals attempted to establish associations between different predictors and depression and to assess whether or not these associations were stronger for girls. In addition, the third goal was to establish whether or not relational aggression and victimization would specifically help to account for the sex difference in depression.

**Hypotheses.** The following hypotheses were derived from the three main goals:

H1a: Relational aggression and victimization would each be associated with depression, and this association would be stronger for girls.

H1b: Individuals who are both relationally aggressive and victimized would be at particular risk for depression, and this would be stronger for girls than for boys.

H2: Relational aggression and victimization would each interact with different variables to predict depression.

- H2a: Relational aggression and victimization would each interact with pubertal status to predict depression, and this association would be stronger for girls.
- H2b: Relational aggression and victimization would each interact with early pubertal timing to predict depression, and this association would be stronger for girls.
- H2c: Relational aggression and victimization would each interact with rumination

to predict depression, and this association would be stronger for girls.

- H2d: Relational aggression and victimization would each interact with co-rumination to predict depression, and this association would be stronger for girls.

H3: Rumination and co-rumination would each mediate the association between relational aggression and depression and relational victimization and depression.

H4: Relational aggression and victimization would mediate the association between sex and depression.

## **Method**

### **Participants**

Participants included 499 middle school students (51% female) who were recruited from general education classes at a public middle school in a Midwestern suburb. The sample included 140 students in sixth grade, 148 students in seventh grade, and 211 students in eighth grade, who ranged in age from 10.9 to 15.2 years (mean = 13.4 years). The racial/ethnic composition of the sample was as follows: 80.8% Caucasian, 4.2% Black, 2.6% Latino/Hispanic, 4.0% biracial/multiracial, 2.8% Asian, 0.2% Native American, 1.0% other, and 4.4% were missing data on this variable. Approximately 8.4% of students at the participating school received free or reduced price lunch.

The teachers of the participating students were also recruited to participate in the study. Twenty-seven teachers participated. Each teacher completed questionnaires on students in their homeroom (although they also taught the students in other classes). The majority of teachers completed questionnaires on a number of students, ranging from 12 to 27. One exception was a teacher who completed questionnaires for 41 of the health

class students. There was one other exception of a participant who was in gifted classes for whom a separate teacher completed the measures.

### **Procedure**

The study was approved by the Institutional Review Board at the author's institution and by the school principal and superintendent of the participating school. All participants were treated within the ethical guidelines outlined by APA.

Half of the sixth- and seventh-grade homeroom classes and all of the eighth-grade homeroom classes at the participating school were recruited to participate. In addition, students currently enrolled in health class were also recruited. Parents of students in participating classrooms were provided with information about the study and consent forms through parent-teacher conferences or through letters sent home. Only those students who returned a consent form with signed parent approval were eligible for participation in the study. The consent rate was 73%.

The student participants completed paper-and-pencil questionnaire measures at school during two homeroom periods, each lasting approximately 20 minutes, or during health class. Students not participating in the study engaged in regular homeroom activities. Participants received their choice of either a food snack (e.g., granola bar) or small item (e.g., pen) as compensation for participation.

Participating teachers completed paper-and-pencil questionnaires on their own time outside of class. They received compensation in the form of a \$40 gift card for completing the questionnaires for the participating students in their class.

### **Measures**

**Relational aggression and victimization.** Participants completed two measures to assess aggression and victimization. Specifically, the Child Social Behavior Scale – Self-Report (Crick & Grotpeter, 1995) was used to assess relational aggression. The relational aggression subscale consists of five items (e.g., “Some kids tell lies about a classmate so that the other kids won’t like the classmate anymore. How often do you do this?”). Items were rated on a 5-point likert scale, ranging from “Never” to “All the time.” The items were summed to yield a total relational aggression score, which demonstrated acceptable internal consistency with  $\alpha = .76$ .

The Children’s Self Experience Questionnaire (Crick & Grotpeter, 1996) was used to assess relational victimization. Five items were administered to assess relational victimization (e.g., “How often does a kid spread rumors or gossip about you to make others not like you anymore?”). Items were rated on a 5-point likert scale, ranging from “Never” to “All the time” and were summed to yield a total relational victimization score, which demonstrated acceptable internal consistency with  $\alpha = .83$ .

Although these instruments were developed for use with younger children (e.g., middle childhood), they have been used with 6<sup>th</sup> graders (Crick & Grotpeter, 1995, 1996), as well as with older adolescents (e.g., Hoggins & Leadbeater, 2007; Leadbeater et al., 2006). The wording of both questionnaires was slightly modified to suit middle-school students (e.g., “Some kids try to keep certain people from being in their group when it is time to do an activity” instead of “Some kids try to keep certain people from being in their group when it is time to play or do an activity”).

Teachers completed the Child Social Behavior Scale – Teacher-Report (Crick,

1996) to assess participating students' relational aggression. The relational aggression subscale consists of five items (e.g., "This child spreads rumors or gossips about some peers"). All items were rated on a 5-point scale, ranging from "Never true" to "Almost always true" and were summed to yield a total relational aggression score. The subscale demonstrated good internal consistency with  $\alpha = .93$ .

Teachers also completed the Children's Self-Experience Questionnaire – Teacher Report (Cullerton-Sen & Crick, 2005) to assess participating students' relational victimization. The relational victimization subscale consists of three items (e.g., "This child is the target of rumors or gossip in the group"). All items were rated on a 5-point scale, ranging from "Never true" to "Almost always true." Items were summed to yield a total relational victimization score, which demonstrated good internal consistency:  $\alpha = .92$ .

**Depressive symptoms.** Participants completed the Children's Depressive Inventory (Kovacs, 1982), which was used to assess depressive symptoms. The items assessing suicidality were dropped and a few positive filler items were added. Twenty-six items were used to assess depressive symptoms. For each item, participants indicated which of three responses best described how they felt (e.g., 0 = "I feel like crying everyday"; 1 = "I feel like crying many days"; 2 = "I feel like crying once in a while"). Items were summed to yield a total depressive symptoms score. The scale demonstrated good internal consistency ( $\alpha = .89$ ).

Teachers completed the anxious/depressed subscale and the withdrawn/depressed subscales from the Teacher Report Form (TRF; Achenbach & Rescorla, 2001) to further

assess depressive symptoms in participating students. The items assessing suicidality were not included. On both scales, teachers rated each item on the following scale: 0 = “Not true (as far as you know)”; 1 = “Somewhat or sometimes true”; 2 = “Very true or often true.” The Anxious/Depressed subscale consists of 15 items (e.g., “Cries a lot”, “Feels worthless or inferior”), and the Withdrawn/Depressed subscale consists of eight items (e.g., “Would rather be alone than with others”, “Unhappy, sad, or depressed”). Items were summed within the subscales to yield anxious/depressed and withdrawn/depressed scores. Both subscales demonstrated adequate internal consistency:  $\alpha = .84$  for Anxious/Depressed and  $\alpha = .90$  for Withdrawn/Depressed. A composite variable was then created by combining the two subscale scores to yield an overall depressive symptoms score. This overall subscale also demonstrated adequate internal consistency, with  $\alpha = .88$ .

**Pubertal development.** Per an agreement with the school principal, only participating students who were currently taking health class were allowed to complete the full measure of pubertal development. In contrast, the rest of the sample was only allowed to complete one question each on pubertal status and timing. Thus, more subjective measures of pubertal status and timing were assessed in the entire sample, with the questions worded slightly differently for boys and girls. For boys, subjective pubertal status was assessed with one question: “Would you say that your pubertal development is complete (growth in height, body hair, facial hair, skin changes, deepening of voice all completed)?” Response options were “No” or “Yes.” For boys, subjective pubertal timing was assessed by the following question: “Do you think your development is any earlier or

later than most other boys your age.” Participants responded on a 5-point likert scale, ranging from “Much earlier” to “Much later.” For girls, subjective pubertal status was assessed with one question: “Would you say that your pubertal development is complete (growth in height, body hair, skin changes, breast development all complete)?” Response options were “No” or “Yes.” For girls, subjective pubertal timing was assessed by the following question, rated on a 5-point scale: “Do you think your development is any earlier or later than most other girls your age.” Participants responded on a 5-point likert scale, ranging from “Much earlier” to “Much later.” For both boys and girls, the subjective pubertal timing items were reverse coded to be consistent with the other puberty measures. Thus, for both boys and girls, higher subjective pubertal status scores indicated more advanced physical maturation, and higher subjective pubertal timing scores indicated earlier pubertal timing.

As previously mentioned, participating students who were in health class completed a more detailed measure of pubertal development. The health subsample consisted of 151 students (48% female; 71 in sixth grade and 80 in seventh grade). No eighth grade students were enrolled in health class at the time of the study. Participants in the health subsample completed the Pubertal Development Scale (PDS; Petersen, Crockett, Richards, & Boxer, 1988), which was used to assess pubertal status and timing. There are two versions of this measure: one for males and one for females; each participant completed the measure appropriate to his/her sex. The PDS consists of five items for girls (assessing growth spurt, body hair, skin changes, breast development, and menarche) and five items for boys (assessing growth spurt, body hair, skin changes, voice



deepening, facial hair). Each item was rated on a 4-point scale, ranging from “Not yet started” to “Seems completed”, with the exception of the menarche item, which was rated as “No” or “Yes.”

Pubertal status was assessed by computing the sum score of the five PDS items, with higher scores indicating more advanced pubertal development. For boys, the scale demonstrated adequate internal consistency, with  $\alpha = .77$ . For girls, the internal consistency was somewhat lower, with  $\alpha = .64$ . However, this is consistent with past research (Ge et al., 2001). Pubertal timing was computed by standardizing PDS scores within sex and age (see for example Ge et al., 2003), and was used as a continuous measure (Negriff et al., 2008). Thus, negative pubertal timing scores indicated later pubertal timing, whereas positive pubertal timing scores indicated earlier pubertal timing relative to peers of the same sex and age.

**Rumination and co-rumination.** A rumination scale was created for the study, adapted from the Rumination Scale of the Response Style Questionnaire (Nolen-Hoeksema & Jackson, 2001) to assess ruminative behaviors specifically in response to victimization experiences. In other words, participants were asked what they do when someone from school is mean to them (for example, they were excluded from a group, someone spread a rumor or gossiped about them, or someone threatened to not be their friend anymore). They were then asked to respond to seven items (e.g., “think about what happened over and over again”) on a 5-point likert scale, ranging from 1 (Not at all true) to 5 (Really true). Items were summed to yield an overall rumination score. The scale demonstrated good internal consistency, with  $\alpha = .91$ .

A revised version of the co-rumination scale (Rose, 2002) was used to assess co-rumination. The wording of the instructions was modified. Rather than asking about when the participant and his/her friend talk about their problems more generally, the modified questionnaire asked specifically about when participants talk about an experience when someone was mean to them (they were provided with examples of relationally aggressive behaviors). They were then asked to respond to nine items (e.g., “we try to figure out every one of the bad things that might happen because of the problem”) on a 5-point likert scale, ranging from “Not at all true” to “Really true.” Items were summed to yield an overall co-rumination score. The scale demonstrated good internal consistency, with  $\alpha = .91$ .

## **Results**

### **Descriptive Statistics**

Descriptive statistics were first computed on all of the variables. Table 1 presents the means and standard deviations for each variable, both for the overall sample and by sex. T-tests were used to examine sex differences in each of the variables, with the exception of the pubertal timing variable since this variable was computed by standardizing within sex and age. With respect to relational aggression and relational victimization, girls reported more self-report relational victimization than boys,  $t(485) = -1.99, p < .05$ , but there were no sex differences in teacher-reported relational victimization or in relational aggression (both self and teacher reports), all  $ps > .05$ . Sex differences favoring girls were also evident for rumination,  $t(484) = -5.45, p < .01$ , co-rumination,  $t(484) = -10.75, p < .01$ , and pubertal status,  $t(147) = -5.76, p < .01$ .

Importantly, there was no sex difference in depressive symptoms, both in the self-report CDI scores,  $t(477) = 1.11, p > .05$ , and the teacher-report TRF scores,  $t(488) = .42, p > .05$ . An examination of the sex difference in these scores at each grade level (6, 7, 8) also revealed no significant differences (all  $ps > .05$ ).

### **Preliminary Analysis of Variables**

Given the two sources of data for relational aggression, relational victimization, and depressive symptoms (self and teacher report), the variables were examined to determine whether or not the creation of composite variables for each construct was justified. First, the correlations were examined and then confirmatory factor analysis was used to test whether a one-factor model (with self and teacher-report items all loading onto one factor) fit the data better than a two-factor model (self-report and teacher-report). The confirmatory factor analyses were computed using Mplus 5.

The correlation between self and teacher-report measures of relational aggression was small ( $r = .15, p < .01$ ), suggesting a lack of consistency across reporters. A confirmatory factor analysis of a two-factor model was computed. Model fit was generally good,  $\chi^2(34) = 96.76, p < .01, CFI = .98, RMSEA = .06$ . Model fit deteriorated in the one-factor model,  $\chi^2(35) = 685.85, p < .01, CFI = .75, RMSEA = .19$ . The two-factor model fit the data significantly better than the one-factor model,  $\chi^2_{\text{dif}}(1) = 589.09, p < .01$ .

Similar results were found with respect to relational victimization. The correlation between self and teacher-report measures was small ( $r = .28, p < .01$ ). Confirmatory factor analysis was used to compare a two-factor and one-factor model. Model fit for the

two-factor model was generally good,  $\chi^2(19) = 77.08, p < .01, CFI = .98, RMSEA = .06$ . Model fit deteriorated in the one-factor model,  $\chi^2(20) = 1140.39, p < .01, CFI = .48, RMSEA = .34$ . The two-factor model fit the data significantly better than the one-factor model,  $\chi^2_{\text{dif}}(1) = 1063.31, p < .01$ .

Finally, with respect to depressive symptoms, the correlation between self and teacher-reports was again small ( $r = .15, p < .01$ ). With respect to the confirmatory factor analysis, model fit for the two-factor model was moderate  $\chi^2(1126) = 3886.33, p < .01, CFI = .66, RMSEA = .07$ . However, model fit was worse in the one-factor model,  $\chi^2(1127) = 5885.27, p < .01, CFI = .41, RMSEA = .09$ . Furthermore, the two-factor model fit the data significantly better than the one-factor model,  $\chi^2_{\text{dif}}(1) = 1998.94, p < .01$ .

Therefore, given the small correlations across reporter for each of the three constructs and the confirmatory factor analysis findings that two-factor models fit the data better than one-factor models, composite variables were not created. Furthermore, a decision was made to use teacher-reports of aggression and victimization and self-reports of depressive symptoms for the analyses. This decision was made for two reasons. First, given the overlap in reporters for predictors and outcomes (e.g., self-report aggression and self-report depressive symptoms), shared reporter bias was of concern. Thus, a more stringent approach was adopted to avoid any shared reporter bias in which analyses were computed with predictor variables from one reporter (e.g., teacher) with outcome variables from another reporter (e.g., self). Second, teacher reports of aggression and victimization were chosen because it was hypothesized that adolescents might not

accurately report their own aggression because of social desirability bias (see discussion in Pakaslahti & Keltikangas-Jarvinen, 2000). Furthermore, teachers should have an accurate assessment of the adolescents' behavior with their peers at school. Conversely, it was hypothesized that adolescents would be best able to report on their own depressive symptoms, as many depressive symptoms are based on internal feelings, which may not be easily visible to others (Essau & Ollendick, 2009).

Finally, as part of the preliminary analyses, the distribution of the outcome variable, in this case CDI scores, was examined. The skew statistic was 1.38, and the kurtosis statistic was 1.62, both indicating that the scores were fairly normally distributed. Thus, no data transformations were needed.

### **Correlations**

To assess initial associations between the constructs, bivariate correlations were computed, both for the overall sample (Table 2) and by sex (Table 3).

**Overall correlations.** Relational aggression was associated with relational victimization ( $r = .67, p < .01$ ) and co-rumination ( $r = .12, p < .05$ ) but not with rumination or any of the puberty variables ( $ps > .05$ ). Thus, higher relational aggression was associated with relational victimization and co-rumination.

Relational victimization was associated with depressive symptoms ( $r = .13, p < .01$ ), rumination ( $r = .11, p < .05$ ), and, at a trend level, co-rumination ( $r = .08, p < .10$ ). Relational victimization was not correlated with any of the puberty variables ( $ps > .05$ ). Thus, higher relational victimization was associated with higher depressive symptoms and rumination and was marginally associated with co-rumination.

**Correlations by Sex.** For boys, relational aggression was associated with relational victimization ( $r = .59, p < .01$ ) but not with any of the self-report variables ( $p > .05$ ). For girls, relational aggression was associated with relational victimization ( $r = .74, p < .01$ ) but was also associated with co-rumination ( $r = .13, p < .05$ ). Thus, for both boys and girls, higher relational aggression was associated with higher relational victimization, but for girls, it was also associated with higher co-rumination.

For boys, relational victimization was associated with rumination ( $r = .14, p < .05$ ), and, in the health sample, with less advanced pubertal status ( $r = -.29, p < .05$ ) and later pubertal timing ( $r = -.32, p < .05$ ). For girls, relational victimization was associated with depressive symptoms ( $r = .19, p < .01$ ) and, at a trend level, co-rumination ( $r = .11, p < .10$ ). Thus, for boys, higher relational victimization was associated with higher rumination, physical immaturity, and later pubertal timing. In contrast, for girls, relational victimization was associated with depressive symptoms and marginally with co-rumination.

Sex differences in correlations were tested using Fisher's  $r$ -to- $z$  test. Of note, relational aggression was more strongly correlated with relational victimization for girls than for boys. In the health subsample, although the individual correlations were not significant, the correlation between relational aggression and pubertal timing differed by sex, such that the association was positive for girls and negative for boys. Furthermore, relational victimization was negatively associated with both pubertal status and timing for boys but was not associated with either construct for girls. Thus, for boys, less advanced pubertal status and later pubertal timing was associated with higher relational

victimization, whereas these associations were not significant for girls.

### **Description of Main Analyses**

Hierarchical linear regressions were used to test the main hypotheses. Given the strong correlation between relational aggression and victimization ( $r = .67, p < .01$ ), each was entered as a control when examining the other (e.g., in analyses examining relational aggression, relational victimization was entered first as a control variable).

### **Hypothesis 1**

First, because Hypothesis 1a was that relational aggression and relational victimization would be more strongly linked to depressive symptoms for girls than boys, sex was examined as a moderator of the association between relational aggression and depressive symptoms and between relational victimization and depressive symptoms. Thus, two regressions were computed. In the first, sex and relational victimization were entered in step 1, relational aggression in step 2, and then sex\*relational aggression in step 3. Results are presented in Table 4. After controlling for sex and relational victimization, relational aggression was not associated with depressive symptoms ( $\beta = -.02, p > .05$ ). Furthermore, the interaction between sex and relational aggression was not significant ( $\beta = .02, p > .05$ ). Thus, Hypothesis 1a was not supported with respect to relational aggression.

The second regression was the same except relational victimization was tested instead of relational aggression (See Table 5). After controlling for sex and relational aggression, relational victimization was significantly associated with depressive symptoms ( $\beta = .15, p < .05$ ); however, sex did not moderate this association ( $\beta = .06, p >$

.05). Thus, those individuals who were relationally victimized (according to their teachers) reported higher levels of depressive symptoms, but this association did not differ for boys and girls.

Hypothesis 1b was that relational aggression and relational victimization would interact to predict depressive symptoms. Thus, in the third regression, sex was entered in step 1, relational aggression and relational victimization were entered in step 2, all the two-way interactions were entered in step 3 (sex\*relational aggression, sex\*relational victimization, relational aggression\*relational victimization), and the three-way interaction (sex\*relational aggression\*relational victimization) was entered in step 4. As evident in Table 6, neither the relational aggression\*relational victimization nor the sex\*relational aggression\*relational victimization interaction were significant ( $\beta = -.02, p > .05$  and  $\beta = -.05, p > .05$ , respectively). Thus, Hypothesis 1b was not supported.

## **Hypothesis 2**

Hypothesis 2 stated that relational aggression and victimization would interact with other variables to predict depressive symptoms, and these associations would be stronger for girls. To test this hypothesis, a series of regression analyses were conducted, each looking at one of the variables of interest: pubertal status, pubertal timing, rumination, and co-rumination. First, pubertal status was examined (Hypothesis 2a). In this regression, sex and relational victimization were entered in step 1, relational aggression and pubertal status were entered in step 2, the two-way interactions (sex\*relational aggression, sex\*pubertal status, relational aggression\*pubertal status) were entered in step 3, and the three-way interaction (sex\*relational aggression\*pubertal



status) was entered in step 4. Similar regressions were computed for pubertal timing (Hypothesis 2b), rumination (Hypothesis 2c), and co-rumination (Hypothesis 2d) in which each of these variables was substituted for pubertal status. Furthermore, this series of analyses was also computed for relational victimization.

**Pubertal status and timing.** The first set of regressions was computed for the entire sample on the subjective puberty variables (subjective pubertal status and subjective pubertal timing). Subjective pubertal status did not interact with relational aggression to predict depressive symptoms ( $\beta = .09, p > .05$ ; see Table 7). Furthermore, the sex\*relational aggression\*pubertal status interaction was not significant ( $\beta = .06, p > .05$ ). Similar findings were found with respect to relational victimization (see Table 8). Subjective pubertal status did not interact with relational victimization to predict depressive symptoms ( $\beta = .08, p > .05$ ), nor was the sex\*relational victimization\*pubertal status interaction significant ( $\beta = .04, p > .05$ ). In fact, in both of these regressions, the final models were not significant. Therefore, adolescents' reports of their pubertal status did not impact the association between relational aggression and depressive symptoms or between relational victimization and depressive symptoms.

Similarly, the final models were also not significant for subjective pubertal timing (see Table 9). Thus, subjective pubertal timing did not significantly interact with relational aggression ( $\beta = -.01, p > .05$ ) or sex and relational aggression ( $\beta = .03, p > .05$ ) in predicting depressive symptoms. In addition, subjective pubertal timing did not significantly interact with relational victimization ( $\beta = .01, p > .05$ ) or sex and relational victimization ( $\beta = .00, p > .05$ ) in predicting depressive symptoms (see Table 10).

Therefore, adolescents' perceptions of their own pubertal timing did not moderate the association between relational aggression and depressive symptoms or between relational victimization and depressive symptoms.

The second set of analyses was conducted on the subsample of students who completed the full PDS measure (sixth and seventh grade students who had completed the full measure during health class). The models are presented in Tables 11 through 14. As indicated and similar to the findings for the full sample with the subjective puberty measures, none of the final models were significant. Thus, in the health subsample, neither pubertal status nor pubertal timing moderated the association between either relational aggression and depressive symptoms or relational victimization and depressive symptoms.

**Co-rumination and rumination.** The next set of regressions examined co-rumination and rumination as moderators. The interaction between relational aggression and co-rumination was not significant ( $\beta = .04, p > .05$ ), nor was the interaction between sex, relational aggression, and co-rumination ( $\beta = -.02, p > .05$ ; see Table 15). Similarly, co-rumination did not interact with relational victimization ( $\beta = .02, p > .05$ ), nor did it interact with sex and relational victimization to predict depressive symptoms ( $\beta = -.02, p > .05$ ; see Table 16). Thus, co-rumination did not appear to function as a moderator of the association between relational aggression and depressive symptoms or between relational victimization and depressive symptoms.

In contrast to the aforementioned findings, there was evidence that rumination moderated the association between relational aggression and depressive symptoms ( $\beta =$

.13,  $p < .01$ ); however, this interaction was not moderated by sex ( $\beta = -.04, p > .05$ ).

As shown in Table 17, the addition of the two-way interactions at Step 3 was associated with a significant change in variance accounted for ( $R^2\Delta = .02, F\Delta = 2.57, p = .05$ ).

Following Aiken and West (1991), simple slopes were plotted and tested at 1 SD above and below the mean for rumination. Figure 1 shows a graphical depiction of the interaction. Both of the simple slopes were significant at a trend level. For low rumination, relational aggression was negatively associated with depressive symptoms ( $\beta = -.14, p < .10$ ). For high rumination, relational aggression was positively associated with depressive symptoms ( $\beta = .13, p = .10$ ). Thus, for those adolescents who ruminate, relational aggression was associated with higher levels of depressive symptoms.

In contrast, there was no evidence that rumination moderated the association between relational victimization and depressive symptoms (see Table 18). Neither the relational victimization\*rumination nor the sex\*relational victimization\*rumination interactions were significant ( $\beta = .06, p > .05$  and ( $\beta = -.01, p > .05$ , respectively).

### **Hypothesis 3**

Hypothesis 3 stated that co-rumination and rumination would each mediate the association between relational aggression and depressive symptoms and between relational victimization and depressive symptoms. Baron and Kenny (1986) suggest a number of criteria that must be met for mediation. First, the predictor must be correlated with the mediator. Second, the mediator must be correlated with the outcome variable. Third, the predictor must be correlated with the outcome variable. Fourth, when the mediator is entered into the analysis, the association between the predictor and the

outcome must be significantly reduced (for partial mediation) or reduced to zero (for full mediation).

Therefore, Steps 1, 2, and 3 can be established from the initial correlation analyses. For step 4, regressions were computed. Specifically, control variables were entered in step 1, the predictor was entered in step 2, and the mediator was entered in step 3. The change in the coefficient for the predictor (from step 2 to step 3) was tested according to Sobel's test, as discussed by Baron and Kenny (1986).

Given that relational aggression was not associated with depressive symptoms in the overall sample ( $r = .07, p > .05$ ) or for boys ( $r = .04, p > .05$ ) or girls ( $r = .11, p > .05$ ), only relational victimization was examined in these analyses

From the initial overall correlations shown in Table 2, it is evident that co-rumination was not associated with depressive symptoms ( $r = -.04, p > .05$ ). As shown in Table 3, this was true both for boys ( $r = -.02, p > .05$ ) and for girls ( $r = -.02, p > .05$ ). Therefore, criteria were not met for co-rumination as a mediator of the association between relational victimization and depressive symptoms.

From the initial overall correlations (Table 2), relational victimization was associated with rumination ( $r = .11, p < .05$ ). In addition, rumination was associated with depressive symptoms ( $r = .17, p < .01$ ). Furthermore, relational victimization was associated with depressive symptoms ( $r = .13, p < .01$ ). Table 19 shows the results of the test of step 4. As seen, the unstandardized coefficient for relational victimization decreased from  $B = .45$  to  $B = .37$  when rumination was entered into the model (the standardized coefficient decreased from  $\beta = .15$  to  $\beta = .12$ ). Sobel's test indicated that

this was a significant reduction,  $z = 2.54, p < .05$ . Therefore, rumination partially mediated the association between relational victimization and depressive symptoms.

The analyses were also examined by sex to assess for sex differences in this mediation model. However, mediation could not be established for boys and girls separately. For boys, relational victimization was not associated with depressive symptoms ( $r = .07, p > .05$ ). For girls, relational victimization was not associated with rumination ( $r = .08, p > .05$ ). Thus, the mediation model was best interpreted as an overall effect and not one moderated by sex.

#### **Hypothesis 4**

Hypothesis 4 stated that relational aggression and relational victimization would partially mediate the sex difference in depressive symptoms. Given that there was not a sex difference in depressive symptoms (see Table 1), no analyses were computed.

#### **Discussion**

This study was the one of the first studies to examine whether relational aggression and victimization contribute to the sex difference in adolescent depression. However, in this sample, there was no evidence of a sex difference in depressive symptoms, either in self-report measures or teacher-report measures. Furthermore, when the scores were examined by grade, there was no evidence of a sex difference at sixth, seventh, or eighth grade. It is possible that the sample was too young and that the sex difference would have emerged later for these adolescents. Given the average age was 13.4 years, and the sex difference typically starts to emerge at 12 to 13 years (Nolen-Hoeksema & Hilt, 2009), the sample should have been old enough to see some evidence

of the sex difference in depressive symptoms. However, others looking at a similar age range have also not found a sex difference in depressive symptoms (Rudolph & Troop-Gordon, 2010).

Another possibility as to why a sex difference in depressive symptoms was not found could be due in part to the measures of depressive symptoms. However, both the CDI and the TRF are widely used measures (Essau & Ollendick, 2009). Furthermore, meta-analytic findings suggest that the sex difference on the CDI emerges at approximately age 13 years (Twenge & Nolen-Hoeksema, 2002). Although an examination of the sex difference was not possible in this sample, it was still possible to explore how relational aggression and victimization interacted with other constructs in their association with depressive symptoms.

### **Multiple Reporters**

Before the main analyses are discussed, some comments regarding the issue of multiple reporters are warranted. Given the fact that two reports (teacher, self) were available for relational aggression, relational victimization, and depressive symptoms, it was explored whether or not these reports could be combined into composite variables for each construct. However, the correlations were quite small, and the confirmatory factor analyses did not support one-factor latent constructs. One question that arises is why there was such a low correlation across reporters. It has been suggested that self-reports may be influenced by a social desirability bias, in which individuals do not want to indicate their own aggressive behavior (see discussion in Pakaslahti & Keltikangas-Jarvinen, 2000). In fact, Pakaslahti and Keltikangas-Jarvinen (2000) compared peer

nomination, teacher, and self-report measures of relational aggression in a sample of adolescents and found that the bivariate correlation between teacher and self-reports was  $r = .15$ , which is very similar to what was found in the current study.

In the current study, the correlation between self and teacher reports of relational victimization was higher than relational aggression but still small. This is consistent with a study that compared teacher, self, and peer reports of relational victimization in middle childhood and found that the correlation between teacher and self-reports of victimization was  $r = .29$  (Cullerton-Sen & Crick, 2005), which is again very similar to what was found in the current study.

With respect to depressive symptoms, the correlation between self and teacher reports was also small. This is consistent with past research showing that agreement across reporters (e.g., self, parent, teacher) of adolescents' depressive symptoms is generally low (Essau & Ollendick, 2009). Essau and Ollendick (2009) discuss how, although self-reports can be subject to response bias, many believe they are more accurate than others' reports since many symptoms of depression are based on subjective feelings and/or perceptions, and others (such as parents and teachers) may either not be aware or not have an accurate understanding of such subjective feelings in adolescents. Therefore, a decision was made to use the teacher-reports of aggression and victimization with the self-report of depressive symptoms to avoid shared reporter bias.

### **Are Relational Aggression and Victimization More Strongly Associated with Depressive Symptoms for Girls?**

Overall support was not found for the first hypothesis that relational aggression

and relational victimization would be more strongly associated with depressive symptoms for girls. Although acts of relational aggression and relational victimization appear to be more distressing for adolescent girls (Coyne, Archer, Eslea, & Liechty, 2008; Galen & Underwood, 1997; Goldstein & Tisak, 2010; Paquette & Underwood, 1999), it does not appear that either engaging in relational aggression or relational victimization puts girls at any more risk of developing depressive symptoms than boys. This is consistent with meta-analytic findings showing that sex did not moderate the association between relational aggression and internalizing problems (Card et al., 2008). With respect to relational victimization, there is very limited evidence that the association is stronger for girls (Prinstein et al., 2001; Storch et al., 2003), with the majority of studies not reporting gender moderation effects.

Interestingly, in the current study there was no evidence that relational aggression was associated with depressive symptoms. This is inconsistent with literature that shows an association (e.g., Card et al., 2008). In this study, a stringent approach was applied, using teacher reports of aggression and self-reports of depressive symptoms to avoid shared reporter bias, which may have resulted in the lack of association. In contrast, relational victimization was associated with depressive symptoms. Thus, those adolescents who were identified as experiencing relational victimization also reported more depressive symptoms than their peers. It should be noted, however, that the proportion of variance accounted for was quite small. Thus, clearly relational victimization was associated with depressive symptoms, but there are likely many other factors that play a role as well.



### **Do Pubertal Status and/or Pubertal Timing Moderate the Association Between Relational Aggression/Relational Victimization and Depressive Symptoms?**

There was no support for the hypothesis that pubertal development (either status or timing) moderated the association between relational aggression and depressive symptoms or between relational victimization and depressive symptoms. Although very little research has examined this specific question, this lack of findings was surprising given past research showing that puberty interacted with interpersonal stress to predict depressive symptoms (Compian et al., 2009; Conley & Rudolph, 2009; Nadeem & Graham, 2005; Rudolph & Flynn, 2007). Many studies in the past have employed the same measure of pubertal status and timing used in the health subsample. It is possible that the subsample was too small to adequately assess for moderation. In contrast, the items available for the entire sample were more subjective in nature and may not have been the best measures of puberty. However, others have found an effect of subjective measures on internalizing problems, including depression (e.g., Alasker, 1992; Conley & Rudolph, 2009). It is interesting that none of the puberty measures were associated with depressive symptoms, which is inconsistent with the majority of literature showing that pubertal status, timing, or both are associated with depressive symptoms. Thus, it would be important to examine this question in another sample to see if the null findings replicate.

Although not a part of the hypotheses tested, an interesting finding with respect to pubertal development was found in the correlation analyses. For boys in the health subsample, both pubertal status and timing were associated with relational victimization,

and neither of these findings held for girls. It appears that boys who are less physically mature and develop later than their peers may be at risk for experiencing relational victimization by their peers. It is conceivable that these boys are viewed as overall less mature than their peers, which may lead to them being viewed as less “cool” or more annoying by their peers. This, in turn, may lead these immature boys to be relationally victimized by their peers, through behaviors such as being excluded from group activities. This interesting finding should be replicated in future studies.

### **Do Co-Rumination and/or Rumination Moderate the Association Between Relational Aggression/Relational Victimization and Depressive Symptoms?**

There was no evidence that co-ruminating about relational victimization experiences moderated the association between relational aggression and depressive symptoms or between relational victimization and depressive symptoms. Interestingly, co-rumination was not even significantly associated with depressive symptoms in this sample. This is consistent with one study that did not show a concurrent association between co-rumination and depressive symptoms (Hankin et al., 2010) but is inconsistent with past findings that have found an association between co-rumination and depressive symptoms (Calmes & Roberts, 2008; Rose et al., 2007). However, these studies looked at co-ruminating with friends about problems more generally and did not examine co-rumination specifically about relational victimization experiences. In fact, Lavalley and Parker (2009) examined co-ruminating about friendship conflict and did not find that it was associated with depressive symptoms. Perhaps there is something different about co-ruminating with a friend about friendship problems, such as relational victimization, that

does not put one at risk for depressive symptoms. It is possible that instead of putting one at risk for depressive symptoms, co-ruminating about relational victimization experiences may lead to relational aggression. Although they did not look at relational aggression specifically, this is consistent with research by Hankin and colleagues (2010) showing that co-rumination predicted interpersonal-dependent stress, which is stress about interpersonal relationships to which the individual in some way might have contributed (e.g., a fight with a friend). It seems plausible that someone who has been relational victimized and co-ruminates with a friend about that experience may “plot revenge” or engage in relational aggression against the individual who wronged him/her. Interestingly, in the current study, co-rumination was associated with relational aggression. Furthermore, an examination of the correlations by sex showed that this held for girls but was not significant for boys. Longitudinal research would be helpful to determine the sequencing of events (i.e., if ruminating about victimization leads to relational aggression).

In contrast to the findings for co-rumination, there was evidence that rumination moderated the association between relational aggression and depressive symptoms. Consistent with what was hypothesized, for those who had a tendency to ruminate about victimization experiences, relational aggression was more strongly associated with depressive symptoms than for those who did not tend to ruminate. In addition, in contrast to the findings for co-rumination, rumination was associated with depressive symptoms. Therefore, there appears to be something different about ruminating by oneself than with another individual, which is consistent with confirmatory analyses that show these as

distinct constructs (Calmes & Roberts, 2008). Perhaps, adolescents who are ruminating on their own are more rejected or isolated from their peers. It may be for these individuals, who have problems with peer relations, that relational aggression is more strongly associated with depressive symptoms. Interestingly, rumination was correlated with relational victimization but not relational aggression, again suggesting these individuals may be rejected or isolated by peers. In contrast, others may use relational aggression to achieve popularity or status, and, thus, it may not be associated with depressive symptoms for these individuals.

It may also be that some individuals who ruminate about victimization do nothing in response to their victimization, whereas others retaliate. While not assessed in this study, there are different functions of relational aggression. Specifically, reactive aggression is thought to be more retaliatory in nature, whereas proactive aggression is defined as goal-directed (Crick & Dodge, 1996). Research has shown that reactive relational aggression, but not proactive relational aggression, is associated with higher internalizing problems (e.g., Mathieson & Crick, 2010). Therefore, it's possible that the combination of ruminating about victimization experiences and using reactive relational aggression puts one at heightened risk for depressive symptoms. In contrast, those who do not ruminate about victimization and possibly just use relational aggression as part of maintaining status in their peer group, are not at risk for depressive symptoms.

Of course, it is also possible that simply the combination of problematic peer relations (i.e., relational aggression) with problems regulating feelings and cognitions about victimization (i.e., rumination) may heighten one's risk for depressive symptoms.

Future research is needed to replicate this finding and to tease apart the specific mechanisms underlying this interaction.

Finally, there was no evidence that rumination moderated the association between relational victimization and depressive symptoms. Thus, it appears that each of these constructs independently predicted depressive symptoms, rather than interacting, which is consistent with a previous study of adolescents that found that rumination and victimization (that included relational, physical, and verbal victimization) each independently predicted depressive symptoms in adolescents (Erdur-Baker, 2009).

### **Do Rumination and/or Co-Rumination Mediate the Association Between Relational Victimization and Depressive Symptoms?**

Given the association between relational victimization and depressive symptoms, rumination and co-rumination were examined as potential processes that may mediate the association. Contrary to predictions and as previously described, co-rumination was not associated with depressive symptoms and so could not function as a mediator. In contrast, there was support for the hypothesis that rumination about victimization experiences would partially mediate the association between relational victimization and depressive symptoms. Thus, it appears that adolescents who are relationally victimized may ruminate about those experiences, which in turn, puts them at risk for depressive symptoms. Although it is difficult to know exactly how this process works, a number of possibilities are plausible. For example, adolescents who are relationally victimized may be rejected and isolated by peers and not have social supports in place for talking about their experiences. Alternatively, they may have people to talk to but feel embarrassed or

ashamed about the experience and so choose to dwell on their feelings alone. Given how important peer relations are during adolescence, being relationally victimized during this developmental period may be particularly harmful for adolescents and lead them to dwell on the experience, rather than brushing the incident off as not important. Finally, adolescents who are relationally victimized may develop regulation problems, such as difficulty regulating both their negative feelings as well as negative cognitions they may be having about the victimization experiences, which may in turn lead them to feeling depressed.

Overall, this finding is consistent with one study that demonstrated that emotional dysregulation, which included a measure of rumination, mediated the association between relational victimization and internalizing symptoms (McLaughlin et al., 2009).

Furthermore, in another study, rumination partially mediated the association between being relationally victimized by a friend in response to displaying negative emotions and internalizing symptoms (Mathieson et al., 2011). Therefore, rumination appears to be a key process in better understanding the link between relational victimization and depressive symptoms in adolescents.

### **Strengths and Limitations**

The current study had a number of strengths. First, a large sample size was employed spanning three grade levels. The sample size allowed for an examination of the complex moderation analyses computed. Furthermore, the range from sixth to eighth grade allowed for sufficient variability in pubertal development to adequately assess the impact of pubertal status and timing on the other variables (Ge, 2008, personal

communication). Second, multiple reporters (namely teacher and self) were used to gather data on the key variables of interest: relational aggression, relational victimization, and depressive symptoms. This allowed for use of teacher-reports of aggression and victimization with self-reports of depressive symptoms to avoid shared reporter bias, which ultimately resulted in a more stringent test of the hypotheses. Finally, a strength of this study was the measurements of co-rumination and rumination, which were specifically assessed in the context of relational victimization experiences. To date, this is the first study to examine that specific type of co-rumination and rumination.

Although there are a number of strengths associated with the current study, it is not without limitations. First, a number of findings that have been consistently demonstrated in the literature, such as the association between relational aggression and depressive symptoms, between pubertal status/timing and depressive symptoms, and between co-rumination and depressive symptoms, as well as the sex difference in depressive symptoms, were not found in this sample. Therefore, it is possible that this sample may not be generalizable, and so the findings from the current study need to be replicated in future research.

Another limitation of the study was the lack of peer nomination measures for relational aggression and victimization. Peer nominations are often seen as preferable to other assessments because it can be difficult for those outside the peer group to report on experiences happening within the peer group (Crick & Grotpeter, 1995). With respect to the teacher-reports used in the current study, past research has demonstrated strong correlations between teacher-reports and peer nominations of relational aggression

(Crick, 1996) and more modest correlations between teacher-reports and peer nominations of relational victimization (Cullerton-Sen & Crick, 2005). Thus, although there is significant overlap between teacher-reports and peer nominations, collecting peer nominations may have offered some additional information that could have been used in analyses. In this study, the participating school would not allow peer nominations to be collected. Furthermore, peer nominations can be difficult to conduct in middle school, where adolescents are in multiple classes with different peers, as opposed to elementary school, where children are typically in one class with the same peers. Although peer nominations were not used, the study benefited from having teacher reports of aggression and victimization, which are thought to be less subject to social desirability bias than self-reports (Pakaslahti & Keltikangas-Jarvinen, 2000). Future research employing peer nominations, though, would be helpful to further assess the associations tested in the current study.

Finally, due to the nature of the study, directionality could not be assessed. For example, with respect to relational victimization and depressive symptoms, it is possible that relational victimization leads to depressive symptoms, depressive symptoms lead to relational victimization, or the association is bidirectional. Researchers have explored the direction of the association between victimization (not necessarily relational) and depression and found it to be bidirectional (Nishina, Juvonen, & Witkow, 2005; Snyder et al., 2003; Sweeting, Young, West, & Der, 2006), whereas other studies have found that victimization predicts depression but not vice versa (Bond, Carlin, Thomas, Rubin, & Patton, 2001). Studies of interpersonal stress also suggest that it may be important to



examine directionality of the effect between interpersonal stress and depression. For example, Rudolph (2008) found that depression predicted increases in the generation of interpersonal stress for early-maturing youth but not late-maturing youth. In another study, Rudolph, Flynn, Abaied, Groot, and Thompson (2009) found that depression predicted subsequent interpersonal stress, which in turn predicted future depression in adolescent girls.

As previously discussed, it would also be interesting to explore the direction of the association between co-rumination and relational aggression to evaluate whether co-ruminating with a friend about relational victimization experiences may lead to future acts of relational aggression. Finally, the finding that rumination mediated the association between relational victimization and depressive symptoms would be strengthened if replicated in a longitudinal study. Therefore, future longitudinal studies are needed to tease apart the temporal sequencing of these associations.

### **Practical Implications**

Not only does the current study add to the advancement of knowledge about the development of depressive symptoms during adolescence, but it also offers a number of practical implications. First, it supports the need for parents and school personnel to monitor adolescents who are relationally victimized for depressive symptoms. Thus, preventative measures could be taken to help individuals who are relationally victimized cope with their victimization experiences.

Furthermore, given the findings with respect to ruminating about victimization, it may be helpful for school-based interventions targeted at relational aggression/relational

victimization to specifically address those types of cognitions. For clinicians working with individuals who are relationally aggressive, victimized, or both, it may be beneficial to address such cognitions with their clients and assist them in developing other ways of thinking about their victimization experiences. This could include finding ways of regulating negative emotions and developing more solution-focused ways of thinking about conflicts with peers. Similarly, it may be helpful for clinicians to encourage their clients to discuss their victimization experiences in a healthy way, either with friends, parents, or with the clinicians themselves, rather than ruminating about them by themselves.

Finally, the finding that late maturing boys may be at risk for relational victimization has practical implications. Parents and teachers may want to monitor late maturing boys for relational victimization. Preventative interventions may also focus on these at-risk boys. Furthermore, school-based interventions targeted at relational aggression/victimization could include a component about not targeting late maturing adolescents.

### **Conclusions and Directions for Future Research**

Overall, the current study advances the field by exploring the role that two interpersonal factors, relational aggression and relational victimization, play in conjunction with biological (puberty) and psychological (rumination) factors in the development of depressive symptoms during adolescence. This is the first study to examine these constructs in concert. Furthermore, it is the first study to specifically examine rumination and co-rumination in response to relational victimization

experiences. Although many of the hypotheses were not supported, those that were offer important information for the field as well as for those who work with adolescents. However, more research is necessary to better understand the emergence of the sex difference in depression.

According to a developmental psychopathology perspective on depression, further research is needed to explore how these constructs interact with other constructs at multiple levels (e.g., genetic, biological, neurological, family, neighborhood, cultural) to identify various pathways that may lead to depression in adolescence and help to more clearly identify why and how the sex difference in adolescent depression emerges (Cicchetti & Toth, 2009). Given the small proportion of variance in depressive symptoms accounted for by the variables in this study, it is clear that other factors must play a role as well. For example, others have suggested the importance of looking at biological factors, such as HPA axis dysregulation, and genetic risk in understanding the sex difference in depression (Hilt & Nolen-Hoeksema, 2009). Furthermore, in interpersonal models of adolescent depression, it is suggested that multiple interpersonal factors, such as rejection sensitivity, withdrawal, excessive reassurance seeking, and negative perceptions about relationships, are all important to consider (Rudolph, 2009). Thus, while the current study has contributed to an understanding of adolescent depression, future research could expand on this work by examining a broader network of interpersonal constructs as well as other factors across multiple levels. Therefore, this study has laid the groundwork for future research to continue the exploration of how relational aggression and victimization fit into interpersonal and interactive models of

depressive symptoms during adolescence.

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**Appendix A**

## Tables

Table 1

*Descriptive Statistics for All Variables for the Overall Sample and by Sex*

Variable	Total		Males		Females		Sex Difference
	<i>Mean</i>	<i>(SD)</i>	<i>Mean</i>	<i>(SD)</i>	<i>Mean</i>	<i>(SD)</i>	
<u>Teacher-Report</u>							
Relational aggression	7.20	3.49	7.08	3.47	7.32	3.51	
Relational victimization	4.43	2.23	4.38	2.23	4.48	2.24	
Depressive symptoms (TRF)	4.42	5.21	4.52	5.28	4.32	5.14	
<u>Self-Report</u>							
Relational aggression	7.09	2.26	7.16	2.62	7.03	2.27	
Relational victimization	9.09	3.57	8.76	3.50	9.40	3.60	*
Depressive symptoms (CDI)	7.05	6.73	7.40	6.75	6.72	6.71	
Rumination	20.61	7.34	18.80	7.01	22.32	7.24	**
Co-rumination	23.03	8.28	19.29	7.29	26.55	7.59	**
Subjective pubertal status	1.09	0.29	1.08	0.27	1.10	0.30	
Subjective pubertal timing	2.98	0.86	2.99	0.87	2.98	0.86	
Pubertal status (health subsample)	12.17	3.18	10.87	2.81	13.60	2.97	**
Pubertal timing <sup>a</sup> (health subsample)	0.00	0.99	0.00	0.99	0.00	0.99	

\* $p < .05$ , \*\* $p < .01$

<sup>a</sup>Sex differences were not computed for pubertal timing because this variable was computed by standardizing within age and sex.

*Note.* Sample size was  $N = 499$  for the total sample and  $N = 151$  for the two health subsample items.

Table 2

*Bivariate Correlation Coefficients Across Males and Females*

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
<u>Teacher-Report</u>									
1. Relational aggression	--								
2. Relational victimization	.67**	--							
<u>Self-Report</u>									
3. Depressive symptoms	.07	.13**	--						
4. Rumination	.04	.11*	.17**	--					
5. Co-Rumination	.12*	.08 <sup>t</sup>	-.04	.62**	--				
6. Subjective pubertal status	.00	.00	.06	-.01	.04	--			
7. Subjective pubertal timing	.02	-.02	.04	.05	.12*	.21**	--		
8. Pubertal status (health subsample)	.04	-.03	.09	-.02	.11	.38**	.53**	--	
9. Pubertal timing (health subsample)	.04	-.08	.11	-.11	-.06	.34**	.52**	.86**	--

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ .

*Note.* Sample size was  $N = 499$  for the total sample (measures 1 through 7) and  $N = 151$  for the two health subsample items (measures 8 and 9).

Table 3

*Bivariate Correlation Coefficients for Males (Below Diagonal) and Females (Above Diagonal)*

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
<u>Teacher-Report</u>									
1. Relational aggression	--	<u>.74**</u>	.11	.04	.13*	.01	.00	.10	<u>.18</u>
2. Relational victimization	<u>.59**</u>	--	.19**	.08	.11 <sup>t</sup>	.02	.00	<u>.03</u>	<u>.12</u>
<u>Self-Report</u>									
3. Depressive symptoms	.04	.07	--	.20**	-.02	.03	.12 <sup>t</sup>	.14	.17
4. Rumination	.03	.14*	.18**	--	<u>.65**</u>	<u>.10</u>	.11 <sup>t</sup>	-.18	-.12
5. Co-Rumination	.09	.04	-.02	<u>.53**</u>	--	<u>.10</u>	.12 <sup>t</sup>	-.26*	-.22 <sup>t</sup>
6. Subjective pubertal status	.00	-.01	.09	<u>-.18**</u>	<u>-.08</u>	--	<u>.31**</u>	.39**	.41**
7. Subjective pubertal timing	.04	-.04	-.03	-.01	.14*	<u>.09</u>	--	.50*	.55**
8. Pubertal status (health subsample)	-.17	<u>-.29*</u>	.03	-.15	.00	.33**	.50**	--	.93**
9. Pubertal timing (health subsample)	<u>-.15</u>	<u>-.32*</u>	.06	-.12	.08	.30**	.52**	.97**	--

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ .

*Note.* Underlined correlations differed significantly by sex ( $p < .05$ ) in the Fisher's r-to-z test of independent correlations. Sample size was  $N = 246$  (males) and  $N = 253$  (females) for the total sample (measures 1 through 7) and  $N = 79$  (males) and  $N = 72$  (females) for the two health subsample items (measures 8 and 9).

Table 4

*Hierarchical Regression Analysis of the Association Between Relational Aggression and Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.02	4.79**	2,467	4.79**	.02
Sex	-.05					
RV	.13**					
Step 2		.00	.10	3,466	3.22*	.02
RA	-.02					
Step 3		.00	.12	4,465	2.44*	.02
Sex*RA	.02					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 5

*Hierarchical Regression Analysis of the Association Between Relational Victimization and Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.01	1.97	2,467	1.97	.01
Sex	-.05					
RA	.08 <sup>t</sup>					
Step 2		.01	5.69*	3,466	3.22*	.02
RV	.15*					
Step 3		.00	1.83	4,465	2.88*	.02
Sex*RV	.06					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 6

*Hierarchical Regression Analysis of the Association Between Relational Aggression, Relational Victimization, and Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.00	1.15	1,468	1.15	.00
Sex	-.05					
Step 2		.02	4.25*	3,466	3.22*	.02
RA	-.02					
RV	.15*					
Step 3		.01	.83	6,463	2.02 <sup>t</sup>	.03
Sex*RA	-.04					
Sex*RV	.09					
RA*RV	-.02					
Step 4		.00	.50	7,462	1.80 <sup>t</sup>	.03
Sex*RA*RV	-.05					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.



Table 7

*Hierarchical Regression Analysis of the Interaction Between Relational Aggression and Subjective Pubertal Status in Predicting Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.02	4.54*	2,461	4.54*	.02
Sex	-.04					
RV	.13**					
Step 2		.00	.85	4,459	2.69*	.02
RA	-.02					
Subjective pubertal status	.06					
Step 3		.00	.52	7,456	1.76 <sup>t</sup>	.03
Sex*RA	.01					
Sex*Subjective pubertal status	-.07					
RA*Subjective pubertal status	.09					
Step 4		.00	.36	8,455	1.58	.03
Sex*RA*Subjective pubertal status	.06					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

Note. RA = Relational aggression; RV = Relational victimization.

Table 8

*Hierarchical Regression Analysis of the Interaction Between Relational Victimization and Subjective Pubertal Status in Predicting Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.01	1.85	2,461	1.85	.01
Sex	-.05					
RA	.08 <sup>t</sup>					
Step 2		.02	3.52*	4,459	2.69*	.02
RV	.14*					
Subjective pubertal status	.06					
Step 3		.01	1.11	7,456	2.02 <sup>t</sup>	.03
Sex*RV	.06					
Sex*Subjective pubertal status	-.07					
RV*Subjective pubertal status	.08					
Step 4		.00	.23	8,455	1.79 <sup>t</sup>	.03
Sex*RV*Subjective pubertal status	.04					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 9

*Hierarchical Regression Analysis of the Interaction Between Relational Aggression and Subjective Pubertal Timing in Predicting Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.02	4.19*	2,462	4.19*	.02
Sex	-.04					
RV	.13**					
Step 2		.00	.48	4,460	2.33 <sup>t</sup>	.02
RA	-.02					
Subjective pubertal timing	.04					
Step 3		.01	.81	7,457	1.68	.03
Sex*RA	.02					
Sex*Subjective pubertal timing	.07					
RA*Subjective pubertal timing	-.01					
Step 4		.00	.48	8,456	1.53	.03
Sex*RA*Subjective pubertal timing	.03					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 10

*Hierarchical Regression Analysis of the Interaction Between Relational Victimization and Subjective Pubertal Timing in Predicting Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.01	1.53	2,462	1.53	.01
Sex	-.04					
RA	.07					
Step 2		.01	3.12*	4,460	2.33 <sup>t</sup>	.02
RV	.14*					
Subjective pubertal timing	.04					
Step 3		.01	1.58	7,457	2.01 <sup>t</sup>	.03
Sex*RV	.07					
Sex*Subjective pubertal timing	.07					
RV*Subjective pubertal timing	.01					
Step 4		.00	.00	8,456	1.76 <sup>t</sup>	.03
Sex*RV*Subjective pubertal timing	.00					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 11

*Hierarchical Regression Analysis of the Interaction Between Relational Aggression and Pubertal Status in Predicting Depressive Symptoms in the Health Subsample*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.02	1.36	2,136	1.36	.02
Sex	.02					
RV	.13					
Step 2		.01	.55	4,134	.95	.03
RA	-.04					
Pubertal status	.10					
Step 3		.04	1.98	7,131	1.40	.07
Sex*RA	.23 <sup>t</sup>					
Sex*Pubertal status	.04					
RA*Pubertal status	-.01					
Step 4		.01	1.05	8,130	1.36	.08
Sex*RA*Pubertal status	.14					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 12

*Hierarchical Regression Analysis of the Interaction Between Relational Victimization and Pubertal Status in Predicting Depressive Symptoms in the Health Subsample*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.01	.63	2,136	.63	.01
Sex	.03					
RA	.09					
Step 2		.02	1.28	4,134	.95	.03
RV	.17					
Pubertal status	.10					
Step 3		.04	1.97	7,131	1.40	.07
Sex*RV	.18					
Sex*Pubertal status	.05					
RV*Pubertal status	.06					
Step 4		.00	.10	8,130	1.23	.07
Sex*RV*Pubertal status	.04					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 13

*Hierarchical Regression Analysis of the Interaction Between Relational Aggression and Pubertal Timing in Predicting Depressive Symptoms in the Health Subsample*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.03	1.74	2,133	1.74	.03
Sex	.01					
RV	.16 <sup>t</sup>					
Step 2		.01	.96	4,131	1.35	.04
RA	-.07					
Pubertal timing	.12					
Step 3		.06	2.64 <sup>t</sup>	7,128	1.93 <sup>t</sup>	.10
Sex*RA	.28**					
Sex*Pubertal timing	.03					
RA*Pubertal timing	-.07					
Step 4		.00	.25	8,127	1.71	.10
Sex*RA*Pubertal timing	.06					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 14

*Hierarchical Regression Analysis of the Interaction Between Relational Victimization and Pubertal Timing in Predicting Depressive Symptoms in the Health Subsample*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.01	.67	2,133	.67	.01
Sex	.03					
RA	.09					
Step 2		.03	2.02	4,131	1.35	.04
RV	.22 <sup>t</sup>					
Pubertal timing	.12					
Step 3		.04	1.96	7,128	1.63	.08
Sex*RV	.21*					
Sex*Pubertal timing	.04					
RV*Pubertal timing	.03					
Step 4		.00	.02	8,127	1.42	.08
Sex*RV*Pubertal timing	.02					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.



Table 15

*Hierarchical Regression Analysis of the Interaction Between Relational Aggression and Co-Rumination in Predicting Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.02	5.12**	2,465	5.12**	.02
Sex	-.06					
RV	.14**					
Step 2		.00	.29	4,463	2.70*	.02
RA	.00					
Co-rumination	-.04					
Step 3		.00	.23	7,460	1.63	.02
Sex*RA	-.01					
Sex*Co-rumination	-.01					
RA*Co-rumination	.04					
Step 4		.00	.12	8,459	1.44	.02
Sex*RA*Co-rumination	-.02					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 16

*Hierarchical Regression Analysis of the Interaction Between Relational Victimization and Co-Rumination in Predicting Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.01	2.41 <sup>t</sup>	2,465	2.41 <sup>t</sup>	.01
Sex	-.06					
RA	.09 <sup>t</sup>					
Step 2		.01	2.96 <sup>t</sup>	4,463	2.70*	.02
RV	.14*					
Co-rumination	-.04					
Step 3		.00	.58	7,460	1.79 <sup>t</sup>	.03
Sex*RV	.05					
Sex*Co-rumination	-.01					
RV*Co-rumination	.02					
Step 4		.00	.18	8,459	1.58	.03
Sex*RV*Co-rumination	-.02					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 17

*Hierarchical Regression Analysis of the Interaction Between Relational Aggression and Rumination in Predicting Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.02	4.82**	2,465	4.82**	.02
Sex	-.05					
RV	.13**					
Step 2		.03	6.97**	4,463	5.95**	.05
RA	-.01					
Rumination	.17**					
Step 3		.02	2.57*	7,460	4.54**	.07
Sex*RA	-.01					
Sex*Rumination	.00					
RA*Rumination	.13**					
Step 4		.00	.85	8,459	4.08**	.07
Sex*RA* Rumination	-.04					

\*\* $p < .01$ , \* $p \leq .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 18

*Hierarchical Regression Analysis of the Interaction Between Relational Victimization and Rumination in Predicting Depressive Symptoms*

Step Variable	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1		.01	1.94	2,465	1.94	.01
Sex	-.05					
RA	.08 <sup>t</sup>					
Step 2		.04	9.89**	4,463	5.95**	.05
RV	.12*					
Rumination	.17**					
Step 3		.01	1.24	7,460	3.94**	.06
Sex*RV	.06					
Sex*Rumination	-.01					
RV*Rumination	.06					
Step 4		.00	.06	8,459	3.45**	.06
Sex*RV* Rumination	-.01					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

*Note.* RA = Relational aggression; RV = Relational victimization.

Table 19

*Hierarchical Regression Analysis of Rumination as a Mediator of the Association  
Between Relational Victimization and Depressive Symptoms*

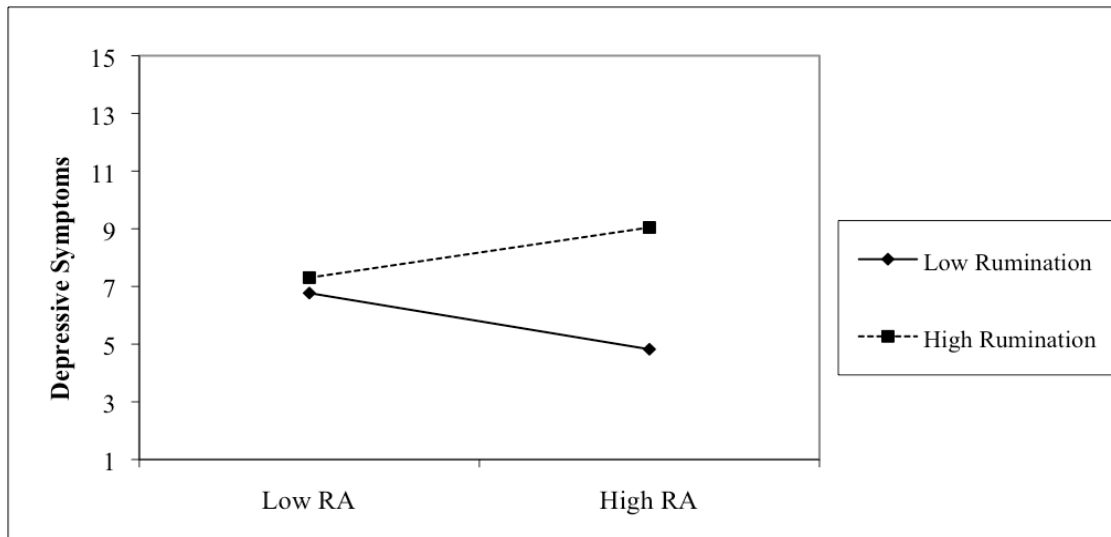
Step Variable	B	End $\beta^a$	$R^2\Delta$	$F\Delta$	Overall $df$	Overall $F$	Overall $R^2$
Step 1			.01	1.94	2,465	1.94	.01
Sex	-.34	-.05					
RA	.15 <sup>t</sup>	.08 <sup>t</sup>					
Step 2			.01	5.80*	3,464	3.24*	.02
Sex	-.34	-.05					
RA	-.04	-.02					
RV	.45*	.15*					
Step 3			.03	13.82**	4,463	5.95**	.05
Sex	-.61 <sup>t</sup>	-.09 <sup>t</sup>					
RA	-.02	-.01					
RV	.37*	.12*					
Rumination	.16**	.17**					

\*\* $p < .01$ , \* $p < .05$ , <sup>t</sup> $p < .10$ . <sup>a</sup> $\beta$  values are standardized.

Note. RA = Relational aggression; RV = Relational victimization.

## Appendix B

### Figures



*Figure 1.* Rumination moderated the association between relational aggression and depressive symptoms.