Summer 8-17-2018

Examining Links between Social Anxiety and Relational Aggression in Adolescence: The Influence of Rumination and Anger

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EXAMINING LINKS BETWEEN SOCIAL ANXIETY AND RELATIONAL

AGGRESSION IN ADOLESCENCE: THE INFLUENCE OF

RUMINATION AND ANGER

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A DISSERTATION

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

(in Psychology)

The Graduate School

The University of Maine

August 2018

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EXAMINING LINKS BETWEEN SOCIAL ANXIETY AND RELATIONAL AGGRESSION IN ADOLESCENCE: THE INFLUENCE OF RUMINATION AND ANGER

By Shannon L. Brothers

Dissertation Advisor: Douglas W. Nangle, Ph.D.

An Abstract of the Dissertation Presented
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Social anxiety is linked to more covert forms of aggressive behavior, particularly reactive and relational aggression in early adolescent and young adult samples. Adolescents with social anxiety and those who engage in reactive relational aggression are also more likely to have difficulties regulating emotions (e.g., anger) and show maladaptive cognitive coping styles (e.g., rumination). The goal of the present study was to assess the relationship between social anxiety and reactive relational aggression in adolescents (14-17 years), combining the form and function of aggression, and to examine trait anger and anger rumination as underlying factors that may explain the relationship between social anxiety and reactive relational aggression. The current study hypothesized that adolescents with social anxiety would engage in reactive relational aggression through the use of anger rumination, and this relationship would only be present in adolescents with higher levels of trait anger.

High school adolescents in grades 9 to 12 (N=105; M_{age} = 15.43; 61% female) were recruited through their local school and community to complete a 30-minute, battery of questionnaires examining social anxiety, trait anger, anger rumination, and reactive relational

aggression. Adolescents completed questionnaires anonymously via an online survey platform, Qualtrics, and were subsequently compensated for their time.

Results supported study hypotheses. Simple regression analyses found that social anxiety was positively related to trait anger, anger rumination and reactive relational aggression. Trait anger and anger rumination were also positively correlated with reactive relational aggression. A conditional process analysis was conducted to test the major study hypothesis. Adolescents with social anxiety were more likely to engage in reactive relational aggression if they ruminated about experiences that created anger, and this relationship was present in adolescents with higher levels of trait anger. Gender differences were also explored. Higher rates of social anxiety and anger rumination were found in females. No other gender differences were found.

Overall, socially anxious adolescents showed a greater tendency to engage in reactive relational aggression adding to the current literature. Difficulties regulating negative emotions, like anger, and ineffective cognitive coping strategies, such as anger rumination, were precipitating factors that likely maintained socially anxious and aggressive behaviors.

DEDICATION

To my parents and siblings. Thank you for your unconditional love and support. Thank you for cheering me on and listening when I needed you. I feel so very fortunate to have you in my life.

ACKNOWLEDGEMENTS

I would like to first thank my advisor and mentor, Douglas Nangle, for his resounding support and guidance throughout my graduate career. I am so appreciative that you were willing to take me on as a 2nd year student. You challenge students and foster growth by pushing students to be their best. I feel like I am a better researcher, clinician, and writer because of that. Thank you to each of my committee members for aiding to bring my dissertation research to fruition. I could not have created this project without your input, feedback and support. Thank you to my lab mates Laura Andrews and Natalie Holbrook for your help, whether it be placing flyers in the community, calling schools, or helping to make connections to increase recruitment numbers. I could not have done this without your help and could not have asked for better lab mates! Thank you to my graduate friend family, you were my family away from home and gave me the motivation and courage to continue even when things were difficult. I am so lucky to call you friends and colleagues.

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CHAPTER I

SOCIAL ANXIETY IN ADOLESCENCE

Definition and Prevalence

Social anxiety is the third most common psychiatric disorder with a prevalence of 8 to 15% in adolescent populations (Kashdan & Herbert, 2001; Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). Higher rates of social anxiety are found in female adolescent populations (Calvete, Orue, & Hankin, 2013; Stein, 1997). Social anxiety is defined as having a "marked fear or anxiety in one or more social situation in which the individual is exposed to possible scrutiny by others and fears he or she will act in a way, or show anxiety symptoms that will be negatively evaluated," leading to rejection (American Psychological Association, 2013, pp. 202-203; Heimberg et al., 2014). For adolescents with social anxiety, feared social situations are either avoided or endured with significant distress, and this increased anxiety causes greater impairment in the adolescent's social, academic, and/or home environments (American Psychological Association, 2013). Social anxiety has an early onset, appearing in childhood to mid-adolescence, and has been diagnosed in children as young as 8 years old (Beesdo et al., 2007; Wittchen, Stein, & Kessler, 1999). The average onset for social anxiety is 11.5 for males and 12.5 for females (Wittchen et al., 1999).

Social anxiety is further characterized by unreasonably strong social evaluative fears with female adolescents, 14-15 years old, showing the highest rates of social evaluative fears (Essau, Conradt, & Petermann, 1999). This social evaluative anxiety is linked to increased fear of negative evaluation (e.g., defined as individuals feeling particularly nervous in situations involving evaluation or fear that others are evaluating them), which is thought to be an essential component of social anxiety (Watson & Friend, 1969). These social evaluative fears may

surround being in new social and/or performance situations (e.g., talking or presenting in front of others), talking to unfamiliar peers, and being observed (e.g., eating, writing). Adolescents with social anxiety also report fearing that something embarrassing or humiliating will happen, they will fail or offend others, and be judged as stupid or crazy (American Psychological Association, 2013; Essau et al., 1999; La Greca & Lopez, 1998; Ollendick & Hirshfeld-Becker, 2002; Wittchen et al., 1999). Adolescents may also present with more somatic symptoms (e.g., blushing, crying), increased irritability and anger, and more rigid temperaments than those without anxiety. Furthermore, adolescents with social anxiety may show more externalizing symptoms (e.g., truancy, covert aggressive behavior) than younger children, leading to the potential misdiagnosis of social anxiety in adolescents (Kashdan & Herbert, 2001).

Etiology and Course

The development and maintenance of social anxiety occurs as a result of continuous and reciprocal interactions between adolescents and their environments (Sroufe, 2007). Depending on these interactions, adolescents may follow a trajectory that leads to maladaptive behaviors and later psychopathology (Ollendick & Hirshfeld-Becker, 2002). For example, adolescents with multiple initial risk factors, such as a family history of anxiety or increased behavioral inhibition (i.e., defined as the tendency to be fearful around new people and to show increased emotional and physiological reactions, as well as poor emotion regulation skills) as children are at heightened risk for developing social anxiety (Bierderman et al., 2001; Clauss & Urbano-Blackford, 2012; Hirshfeld-Becker et al., 2007). Parents also play a major role in the development of social anxiety. In fact, in a cross-sectional study assessing parenting behaviors and social anxiety, youth who perceived their parent to be more rejecting, overprotective, and less emotionally warm had higher levels of social anxiety (Bogels, van Oosten, Muris, &

Smulders, 2001). Parents who overemphasize the importance of others' views and express negative and vigilant world views are also thought to contribute to the development and maintenance of social anxiety. Specifically, these parents may model avoidant and socially isolative behaviors that socially anxious youth may then learn to use to manage their own distress (Kashdan & Herbert, 2001).

Social anxiety is chronic in nature and extremely impairing without treatment (Essau et al., 1999; Wittchen & Fehm, 2003). Adolescents with social anxiety tend to have a lower quality of life in relation to their health and social functioning, lower perceived social support, fewer close relationships, and increased negative affect (Shields, 2004). Even though social anxiety seems to have profound effects on adolescents, youth with social anxiety tend to go unnoticed by parents and school personnel (Kashdan & Herbert, 2001), perhaps because, traditionally, socially anxious children and adolescents tend to be inhibited in many social settings (American Psychological Association, 2013).

Social anxiety is also highly comorbid with depression (Beesdo et al., 2007), substance use, somatoform and other anxiety disorders, namely agoraphobia and unspecified anxiety (Essau et al., 1999). In fact, a diagnosis of social anxiety was found to precede 85% of youth with a comorbid substance use disorder and 64% of youth with a comorbid diagnosis of another anxiety disorder (Wittchen et al., 1999). The presence of social anxiety in adolescence and its comorbidity with depression is important as youth with both disorders are at the greatest risk for developing depression in adulthood, suicidal ideation and attempts, and more frequent episodes of depression (Stein et al., 2001).

Contextual Factors Impacting the Development of Social Anxiety

Given its chronic and impairing nature, it is important to examine contextual factors that can impact the nature and course of social anxiety in adolescence (Ollendick & Hirshfeld-Becker, 2002). Consistent with a developmental psychopathology framework, the present review will focus on several key contextual factors (i.e., biological, emotional, cognitive and social) that influence the development of social anxiety, which will be preceded by a brief summary of normative adolescent development (Rutter & Sroufe, 2000; Steinberg, 2005, 2007; Smetana, Campione-Barr, & Metzger, 2009, Sroufe, 2007). For the purposes of this review, emotional and cognitive factors will be addressed in more depth as they will be the focus of the present study.

Prior to discussion of contextual factors, it is important to review definitional differences amongst age-related terms used throughout the present review. Research examining contextual factors related to social anxiety is relatively limited in middle adolescent populations. As such, to fully understand the breadth of research that may inform the present study, the review will also cover child, early adolescent and young adult research. Within the present review, the term *adolescent* is used to define studies covering middle adolescent (15-17 years old) and early adolescent samples (11-14 years old; Steinberg, 2016), the term *child* is used to describe studies using participants 10 years old and younger, and the term *young adult* is defined as participants who are college-aged and/or enrolled in a university. Furthermore, the term *youth* is discussed as research including more than one age group (e.g., both child and adolescent populations).

Biological

During adolescence, there is maturation within the prefrontal cortex and increased development of cognitive abilities (e.g., long-term planning, abstract thinking). This maturational process appears in brain regions that are important in both behavior and emotion regulation, as well as the perception and evaluation of rewards/risks (Steinberg, 2005). Specifically, the amygdala is believed to assess incoming emotional information, whereas the prefrontal cortex is thought to activate cognitive processes necessary to aid with emotion regulation (Detweiler, Comer, Crum, & Albano, 2014). Further, the prefrontal cortex volume in adolescents is also related to the ability to inhibit behavioral responses, and greater activity within the prefrontal cortex is associated with the adolescent's ability to process emotional information (Yurgelun-Todd, 2007).

Logical reasoning abilities are increasingly enhanced by adolescence. However, social-emotional factors (e.g., impulse control, emotion regulation) that bolster decision-making and regulate risk-taking do not fully develop until early adulthood. In fact, two networks of the brain have been implicated in explaining adolescents' impulsive and risky behavior: the socio-emotional (i.e., includes the amygdala, which regulates processing rewards, emotions, and social information) and cognitive control networks (i.e., includes the prefrontal cortex, which aids with planning and self-regulation). Research suggests that when adolescents are emotionally aroused, the cognitive control network, which helps regulate risky and impulsive behavior, is subdued and the socio-emotional network cannot be shut off, resulting in higher levels of impulsive and risky behaviors (Steinberg, 2007). The literature appears to suggest that these cognitive and emotional processes are underdeveloped in adolescence.

Adding anxiety onto these already underdeveloped factors could result in increased emotional dysregulation and arousal, which may further impact decision-making abilities. In fact, one review found that socially anxious individuals experienced heightened amygdala activation in response to negative affect (e.g., fear and anger) and greater activation within the medial prefrontal cortex, resulting in decision-making deficits (Shin & Liberzon, 2010). Findings appear to suggest that socially anxious adolescents, in particular, may also experience dysregulation within the socio-emotional and cognitive control networks.

In addition to these networks, two biological systems have been implicated in the dysregulation of anxiety: the behavioral inhibition system (BIS) and the hypothalamic-pituitary-adrenal axis (HPA axis). Since studies have focused more on the HPA axis in relation to anxiety, the BIS will be mentioned only briefly here. The BIS is characterized by high levels of anxiety and is thought to prime the HPA axis for activation. The outputs of this system show evidence of anxious emotions, including narrowed attention, increased hypervigilance, scanning behavior, and anxious apprehension (Chorpita & Barlow, 1998). Concurrently, the HPA system is activated and aims to regulate stress, with cortisol as its end product. The literature suggests that chronically high or low levels of cortisol are maladaptive and could precipitate or maintain later psychopathology (e.g., depression, anxiety). In fact, inhibited youth show higher heart rates, lower heart rate variability and higher basal cortisol levels, which are maladaptive physiological responses to stress (Gunnar & Quevedo, 2007). Results have been similar in longitudinal and cross-sectional studies, wherein increased cortisol in female adolescents was linked to heightened symptoms of generalized and social anxiety (Schiefelbein & Susman, 2006). Further, socially anxious children have higher cortisol reactivity in response to social stressors, suggesting a greater HPA reactivity to stress (van West, Claes, Sulon, & Deboutte, 2008). Youth

who have the largest increases in cortisol within social situations are also less socially competent and less able to regulate emotions and aggressive tendencies (Gunner & Quevedo, 2007). These findings suggest that youth who experience anxiety in social situations and are less confident in these interactions may experience higher levels of activation within the HPA axis.

The aforementioned research indicates that adolescents with and without psychopathology are likely to experience underdeveloped emotional abilities (Steinberg, 2007). Specifically, youth with higher levels of social anxiety have increased HPA reactivity and are less able to manage their emotions (Gunnar & Quevedo, 2007; van West et al., 2008). In fact, cross-sectional research with young adults shows that anger and angry reactions to a stressor are related to increased cortisol levels, suggesting that anger and anxiety may share a similar heightened reactivity to stress (Moons, Eisenberger, & Taylor, 2010). As such, the present study will focus on the ability of socially anxious adolescents to process their anger.

Emotional

Emotional instability appears to be commonplace in adolescence, with adolescents experiencing intense and labile emotions (both positive and negative). Although their emotional experience and expression may be volatile in comparison to children, adolescents are more able to independently manage their emotions through the use of emotion regulation strategies (Feldman, 2014; Lougheed & Hollenstein, 2012). Such strategies may include cognitive reappraisal (altering negative thoughts about the self/situation to shift its emotional impact), suppression (inhibiting the expression or feeling of emotion), concealing or adjusting emotions, and emotional engagement (adaptively identifying, managing, and displaying emotions; Gullone, Hughes, King, & Tonge, 2010; Lougheed & Hollensten, 2012).

Although limited, the literature examining these regulatory strategies suggests that the use of certain emotion regulation methods may be linked to internalizing problems. For example, adolescents who employ a combination of strategies to regulate their emotions and are able to adjust their emotions tend to have lower rates of internalizing problems. Conversely, adolescents who employ fewer emotion regulation strategies and engage in higher levels of emotional disengagement tend to have higher levels of internalizing problems overall, and social anxiety, in particular (Lougheed & Hollenstein, 2012). Youth who have fewer regulatory strategies in their repertoire and avoid experiencing and expressing their emotions may be at greatest risk for experiencing emotional dysregulation. Fewer studies, however, have investigated emotional dysregulation and social anxiety in high school-aged adolescents (e.g., Carthy, Horesh, Apter, & Gross, 2010; Klemanski, Curtiss, McLaughlin, & Nolen-Hoeksema, 2017; Lougheed & Hollenstein, 2012). Instead they have focused on internalizing symptoms in children or socially anxious adults (e.g., Erwin, Heimberg, Schneier, & Liebowitz, 2003; Southam-Gerow & Kendall, 2000; Suveg & Zeman, 2010; Weber, Wiedig, Freyer, & Gralher, 2004; Zeman, Shipman & Suveg, 2002).

Overall, research suggests that emotional dysregulation is linked to internalizing disorders (Lougheed & Hollenstein, 2012; Southam-Gerow & Kendall, 2000; Zeman et al., 2002). Specifically, children and adolescents who were diagnosed with an anxiety disorder, to include social anxiety, had more difficulty hiding and changing their emotions (Southam-Gerow & Kendall, 2000) and expressed their emotions in more dysregulated ways (Klemanski et al., 2017). These children were described as more rigid, emotionally labile and negative, and had less appropriate expression and self-awareness of emotion (Suveg & Zeman, 2004). Anxious youth also experienced intense and frequent negative reactions (Carthy et al., 2010) and felt

worry and anger more intensely, but had less constructive ways to deal with these negative

emotions (Suveg & Zeman, 2004). Furthermore, children with internalizing symptoms were

found to express feelings of anger in indirect ways (e.g., whining, crying, slamming doors) and

had lower quality and less adaptive coping strategies (Zeman et al., 2002). In particular, early

adolescents with social anxiety tend to withdraw, resign, or ruminate (i.e., repeated thoughts

surrounding the causes and consequences of one's negative feelings; Smith & Alloy, 2009) as

strategies to regulate their emotions (Asband, Svaldi, Kramer, Breuninger, & Tuschen-Caffier,

2016). Research examining emotional dysregulation and anxiety, however, has not found

differences in the inhibition or suppression of emotion in youth with anxiety versus those

without. This suppression of emotion may become too uncomfortable for youth as the emotions

begin to build up, and as a result the emotions may be manifested in dysregulated ways (Suveg &

Zeman, 2004). Given these findings, one of the central challenges for socially anxious

adolescents could be learning ways to constructively cope with and express feelings of anger

(Zeman et al., 2002).

Socially anxious adults also use ineffective strategies when they are angry (Weber et al.,

2004). For example, in one study using a cross-sectional sample of college students, young

adults with social anxiety reported experiencing greater anger, increased difficulties expressing

anger (Kachin, Newman, & Pincus, 2001; Kasdan, Elhai, & Breen, 2008) and less positive affect

(Kashdan & Collins, 2010). Adults with social anxiety also wanted to express their anger when

they felt criticized and experienced increased anger without provocation (in social and non-social

settings), but tended to suppress this anger (Erwin et al., 2003). Overall, these results indicate

that socially anxious adults show poorer anger expression and regulation skills. One explanation

for this relationship could be the interplay between emotional dysregulation, particularly anger,

and underlying cognitive mechanisms. However, we know less about how socially anxious adolescents manage anger. As such, the current study will be focusing on rumination as one potential mechanism for this increase in angry affect in adolescents with social anxiety.

Cognitive

Within the adolescent period, adolescents think in more abstract terms (e.g., think about issues on a continuum instead of absolute terms) and their logical reasoning abilities are enhanced (Feldman, 2014; Steinberg, 2007). As a result, adolescents may question their parents, as well as authority figures, and may be perceived as more argumentative (Feldman, 2014). Adolescents also tend to engage in egocentrism, which has been defined as the inability to separate what others actually think/feel from one's own worries about the self (Ryan & Kuczkowski, 1994). This egocentric behavior coincides with adolescents' increased ability to engage in formal operational thought processes, such as abstract and deductive reasoning, and the belief that others are just as aware of and concerned with adolescents' cognitive-affective and behavioral responses as they are. This assumption subsequently creates increased self-consciousness and a feeling of being evaluated by others or being the center of attention (also known as the "imaginary audience;" Gray & Hudson, 1984; Vartanian, 2000). This tendency decreases with age, with 12th graders exhibiting less egocentric and self-conscious behaviors than 9th graders. For adolescents, already at risk of developing social anxiety (i.e., exhibit behavioral inhibition), heightened egocentric and self-conscious behaviors may precipitate the onset of socially anxious symptomatology. In fact, cross-sectional literature suggests that adolescents who have increased concerns related to external evaluation and display higher levels of self-consciousness are more likely to experience psychopathology, particularly social anxiety (Ryan & Kuczkowski, 1994).

In addition, adolescents' self-concepts (i.e., their identity or beliefs about themselves) are more developed and organized than those of children. Adolescents are also more aware of different facets of their identity. They evaluate themselves more globally, as well as on specific dimensions (e.g., academics, social relationships, appearance), and acknowledge that others may view them differently than they view themselves (Feldman, 2014; Steinberg, 2001). As a result of this increased self-awareness, adolescents are also more likely to compare themselves to others and understand others can make judgments about them (Sebastian, Burnett, & Blakemore, 2008).

Adolescents also generally have more awareness of their public (i.e., social) and private selves (e.g., thoughts, emotions, insecurities; Alden, Auyeung, & Plascencia, 2014). Although this more developed self-concept can appear positive, it also has a darker side, as clashes among identities can create increased psychological distress (Feldman, 2014) and result in a highly negative and uncertain sense of self. For instance, in those with social anxiety, there can often be two identities: the *actual self* and the *ideal self.* The ideal self describes how one *should* act or present oneself in social situations, whereas the actual self is riddled with imperfections and perceived social blunders. The discrepancy among these identities in those with social anxiety is palpable. This actual self can rarely reach the potential of the idealized self, which precipitates heightened anxiety and increased maladaptive thoughts (Flett & Hewitt, 2014).

Cognitive model of social anxiety. Negative thoughts regarding self-concept and rejection and evaluation by others have been found to maintain maladaptive schemas in adolescents with social anxiety (Calvete, Orue, & Hankin, 2013). The idea of self-concept also appears prominently in many cognitive models of social anxiety (Alden et al., 2014). In fact, cognitive models suggest that those with heightened social anxiety hold negative assumptions

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and beliefs about themselves (Clark & Well, 1995; Heimberg, Brozovich, & Rapee, 2014; Rapee & Heimberg, 1997). For example, Clark and Wells (1995) propose that individuals with social anxiety have unreasonably high standards for social performance (e.g., "I must not let anyone see I am anxious"), conditional assumptions regarding social evaluation (e.g., "If I make mistakes, others will reject me"), and negative beliefs about self-worth and value (e.g., "I am stupid"). These negative beliefs about the self then precipitate and maintain social anxiety (Clark & Wells, 1995).

Those with heightened social anxiety believe others are also more likely to negatively evaluate them and attach great importance to receiving positive feedback from others (Rapee & Heimberg, 1997). When in a social situation with the potential to be evaluated, mental self-schemas are activated for socially anxious adolescents. As a result of these schemas, these adolescents then simultaneously monitor their behavior (e.g., how they appear or compare to others) and internal experiences (e.g., cognitive, physiological, and affective cues), while monitoring the environment for potential threats. This allocation of attention toward the self then limits socially anxious adolescents' ability to evaluate whether their fears and assumptions are valid (e.g., avoiding eye contact limits the potential for social feedback), maintaining the anxiety. A vicious cycle may then ensue with social anxiety triggering rumination about perceived social mistakes and future social events, which then exacerbates anxiety and negative affect (Heimberg, et al., 2014; Rapee & Heimberg, 1997).

Cognitive mechanisms. Several cognitive mechanisms have been linked to social anxiety. For the purposes of this review, the most frequently reported cognitive mechanisms will be briefly noted and the review will delve into rumination in more depth, as it will be a focus of the current study. Overall, adolescents with social anxiety are often hypervigilant to signals of

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threat. Consequently, they are more likely to interpret and perceive ambiguous social situations as threatening. Some authors have called this threat perception bias, others interpretation bias (Kuckertz & Amir, 2014; Miers, Blote, Bogels, & Westenberg, 2008; Muris, Luermans, Merckelbach, & Mayer, 2000; Muris, Merckelbach, & Damsma, 2000). Regardless of the label, adolescents with social anxiety are hypervigilant and "on the lookout" for potential threats leading to rejection and negative evaluation. In fact, adolescents who scored higher on social anxiety measures in one cross-sectional study tended to interpret social situations as more threatening than those with lower levels of social anxiety (Miers et al., 2008). In another cross-sectional study, youth with higher levels of social anxiety decided more quickly and frequently that an ambiguous story was threatening and reported more negative feelings and thoughts when asked how they would handle the situation if it happened to them (Muris et al., 2000). This early detection of threat was replicated in an additional study, wherein girls, in particular, were found to not only show higher levels of social anxiety, but also interpret ambiguous stories as more threatening than boys (Muris, Leurmans, Merckelback & Mayer, 2000). This negative interpretation of ambiguous events, however, was found only in social situations. Socially anxious youth did not differ from those without anxiety when asked to interpret non-social situations (Miers et al., 2008), suggesting the salience of social events in youth with social anxiety.

Similar to this attentional bias towards threat, adolescents with social anxiety tend to expect and perceive rejection by others. Some have referred to this as rejection sensitivity and others fear of negative evaluation (Dewall, Buckner, Lambert, Cohen & Fincham, 2010; Downey & Feldman, 2000). Again, regardless of the label, literature suggests that socially anxious young adults experience more hostile feelings while interacting with others (Dewall et al., 2010) and

perceive they will be evaluated negatively (Leary, Kowalski, & Campbell, 1988). Research has also examined the link between this vigilance toward threat or fear of being negatively evaluated and aggression. Downey and Feldman (2000) investigated social avoidance and distress and its link to relationship investment using a cross-sectional sample of undergraduate males. Findings indicated that males who were highly invested in a romantic relationship were more likely to anxiously expect rejection, which predicted dating violence (i.e., physical aggression; Downey & Feldman, 2000). Although this research has focused more on young adults, it seems reasonable to speculate that adolescents with higher levels of fear of negative evaluation and increased levels of anger may be more likely to act out in aggressive ways.

Rumination, more specifically rumination about experiences that precipitate anger, is another cognitive mechanism linked to social anxiety. Socially anxious individuals are thought to ruminate more after anxiety-provoking social events, mulling over their perceived failures in navigating a given social situation (Kocovski & Rector, 2007). Research has supported this hypothesis in adolescents and young adults. Specifically, in both cross-sectional and longitudinal studies, socially anxious adolescents and young adults exhibited higher levels of rumination subsequent to an anxiety-provoking social event and tended to use rumination as a coping strategy (Jose, Wilkins, & Spendelow, 2012; Kocovski, Endler, Rector & Flett, 2005; Kocovski & Rector, 2007).

Given that socially anxious individuals are poorer at emotional expression and regulation, particularly with respect to anger, it is not surprising that the literature suggests that socially anxious young adults are more likely to use rumination as a coping strategy when angry (Weber et al., 2004). In fact, Trew and Alden (2009) found that increased social anxiety predicted higher levels of trait anger and a more outward expression of anger through increased levels of brooding

(i.e., ruminating about negative experiences) in a college-aged sample. It is possible that ruminating about angry situations could precipitate a greater outward expression of anger in adolescents with social anxiety. Given adolescents' increased concerns of being evaluated by others (Gray & Hudson, 1984; Vartanian, 2000) and the greater importance of peers in adolescence (Detweiler et al., 2014; Feldman, 2014), these aforementioned cognitive factors (e.g., rumination, fear of negative evaluation, hypervigilance to threat) could impact social relationships, specifically forming or maintaining close friendships. Although this is not the focus of the current study, it is important to briefly touch upon how social anxiety may impact, and be impacted by, social relationships. A more thorough review of social functioning, as it relates to aggression, will follow in the next chapter.

Social

Adolescence is an important period for social development. Teens seek increased independence, are more reliant on themselves instead of their parents and seek more control and autonomy over their day-to-day decisions (Feldman, 2014). At the same time, friendships and romantic relationships begin to play a more central role, with adolescents becoming more reliant on these relationships for social and emotional support (Detweiler et al., 2014; Feldman, 2014). Teens are also more attentive towards the opinions of friends, seek increased approval from their peers, and are more likely to be influenced by and conform to peers' behavior (Detweiler et al., 2014; LaFontana & Cillessen, 2010). As a result of this need to fit in with peers, adolescents are more self-conscious and have greater fears related to negative evaluation than children or adults (Detweiler et al., 2014). Friendships and peer groups are also expanding to become more diverse to include both same-gender and opposite gender peers. These mixed-gender peer groups are

important as they provide a shared environment to test out romantic relationships (La Greca & Harrison, 2005).

Given the importance of friendships in adolescence, it is not surprising that research has found that friends may protect adolescents from developing later psychopathology (Vitaro, Boivin, & Bukowski, 2009). In fact, one cross-sectional study revealed that adolescents who experience positive qualities in their close friendships (e.g., affection and support), or that are in a romantic relationship, experience lower levels of social anxiety (LaGreca & Harrison, 2005), suggesting that close friends and romantic partners may buffer adolescents from developing later psychopathology. However, adolescents with social anxiety may have more difficulty creating quality close friendships given that they tend to have lower levels of intimacy and support in their close friendships (LaGreca & Lopez, 1998). Furthermore, socially anxious adolescents have less assertive interpersonal styles and are more dependent on others (Davila & Beck, 2002; Vitaro et al. 2009), which may impact the development and maintenance of friendships in those with social anxiety. In fact, research indicates that youth with higher levels of social anxiety tend to have greater difficulty forming friendships (Walters & Inderbitzen, 1998) and are rejected or neglected (i.e., socially isolated) by their peers (Inderbitzen, Walters, & Bukowski, 1997). These findings suggest that socially anxious adolescents may have more difficulty with social relationships, perhaps leading them to become more withdrawn or avoidant of peers, which may serve to maintain their fear of social interactions.

CHAPTER II

RELATIONAL AGGRESSION IN ADOLESCENCE

This chapter begins with a discussion of aggression, particularly relational aggression, in adolescence. It then reviews definitions of the forms and functions of aggression, more broadly, and subsequently focuses pointedly on relational aggression. As with the previous chapter, the review also includes coverage of the major contextual factors (i.e., emotional, biological, cognitive and social) influencing relational aggression. Research examining contextual factors related to relational aggression is relatively limited in middle adolescent populations. Consequently, in order to more fully comprehend the breadth of research that may inform the present study, the chapter will also cover child, early adolescent and young adult research. The same definitional boundaries for age-related terms will be used for the current chapter (e.g., the term *adolescent* is used to describe studies covering early and middle adolescent samples).

Definitions of Aggression

Aggression is defined as a "behavior directed toward another individual where the immediate intention is to cause harm" (Roberton, Daffern, & Bucks, 2012, p. 73). Two different forms of aggression have been noted: overt and covert. Overt aggression (also called physical or direct aggression) is defined as harming others through physical or verbal means (e.g., hitting, kicking, or verbally threatening others; Prinstein, Boergers & Vernberg, 2001; Prinstein & Cillessen, 2003), whereas covert aggression involves the manipulation of one's social relationships (e.g., gossiping, ostracizing peers; Bjorkqvist, 1994; Crick & Grotpeter, 1995; Galen & Underwood, 2001). Given the current study's focus on covert aggression, the next section describes definitional issues relevant to covert forms of aggression, specifically.

As research on the different forms has expanded over the past few decades, labels and definitions for covert aggression have multiplied (Heilbron & Prinstein, 2008). Indirect, social, and relational are three major terms used to describe covert aggression (Bjorkqvist, 1994; Crick & Grotpeter, 1995; Galen & Underwood, 2001). As such, it is important to address possible definitional differences. Indirect aggression is broadly described wherein one's intent is to harm another not physically or verbally, but in a circuitous way via social manipulation (Bjorkqvist, 1994; Bjorkqvist, Lagerspetz, & Kaukiainen, 1992). Social aggression involves the manipulation of an individual's acceptance into a group through exclusion, isolation, or rumors/gossip and is directed toward 'damaging another person's self-esteem, social status, or both' (Galen & Underwood, 2001, pg. 589). Social aggression can take both direct (e.g., verbal rejection, gossip) or indirect forms (e.g., negative facial expressions, exclusion; Galen & Underwood, 2001). Lastly, relational aggression has been defined as harming others through purposeful manipulation and damaging their social relationships, friendships, or feelings of acceptance in the peer group (Crick & Grotpeter, 1995). Subtle differences have been noted amongst these covert forms, particularly between social and relational aggression. For instance, social aggression includes verbal and nonverbal behaviors involving one's broader social environment (e.g., family, friends, others), whereas relational aggression requires more direct and verbal manipulation of others' peer relationships/status, specifically (Heilbron & Prinstein, 2008). Regardless of the term used, the common thread that links these covert forms of aggression is that they are circuitous ways of manipulating another's social relationships to cause harm. The current review uses the term relational aggression to describe covert forms and physical aggression to refer to overt forms of aggression.

Since both physical and relational aggression inflict harm on another person, it is not surprising they are positively and moderately correlated (*r's* range from .50 to .70; Little, Jones, Henrich, & Hawley, 2003; Prinstein et al., 2001). Although they are related, several studies have noted physical and relational aggression represent distinct constructs (Bjorkqvist, Lagerspetz, & Kaukiainen, 1992; Little et al., 2003). In fact, each form of aggression has been differentially linked to child and adolescent psychosocial adjustment. For example, adolescents who engage in physical aggression are more apt to have lower levels of academic achievement or drop out of school and engage in higher levels of problematic behavior (e.g., tobacco and alcohol use, physical violence; Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006; Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001). Conversely, relationally aggressive children are more likely to experience depression and loneliness and are more isolated from their peers than their non-aggressive counterparts (Crick & Grotpeter, 1995). Young adults who engage in relational aggression are also more likely to have symptoms of social anxiety, especially when they have concerns over their social status within a friendship (Duncan & Owen, 2006).

In addition to examining the forms, researchers have begun to differentiate the functions of aggression. There are two known functions: reactive and proactive. Reactive aggression is defined as an angry response to provocation or a blocked goal, and tends to be more hostile and interpersonal. In contrast, proactive (also called instrumental) aggression occurs in anticipation of some self-serving goal/outcome and is a deliberate and controlled form of aggression (Card & Little, 2006; Marsee & Frick, 2007). Each function of aggression is then related to the respective forms of aggression creating four specific types: reactive relational, proactive relational, reactive physical and proactive physical (Little et al., 2003).

Like the different forms of aggression, the functions are also highly correlated (*r's* range from .77 to .80), but distinct (Card & Little, 2006; Little et al., 2003). Adolescents who engage in reactive aggression appear to have greater levels of frustration, are more hostile towards others, have more difficulty tolerating distress than adolescents who are not reactively aggressive (Little, Brauner, Jones, Nock, & Hawley, 2003) and are more likely to experience internalizing problems (Card & Little, 2006). Conversely, proactively aggressive youth experience less hostility towards peers, have greater social competence, and are planful and calculated in reaching their goals (Little et al., 2003).

Development of Relational Aggression

Relational aggression has been noted early on in development, starting in the preschool years (Crick, Casas, & Mosher, 1997; McNeilly-Choque, Hart, Robinson, Nelson, & Olsen, 1996), and becomes more commonplace in adolescence (Heilbron & Prinstein, 2008). In the preschools years, females engage in higher levels of relational aggression than males (Burr, Ostrov, Jansen, Culllerton-Sen, & Crick, 2005; Crick, Casas, & Mosher, 1997). However, findings concerning gender differences among adolescents are mixed. Some literature suggests that females engage in higher rates of relational aggression than males (Bjorkqvist, et al., 1992; Heilbron & Prinstein, 2008), whereas other studies have found no significant gender differences, indicating males and females engage in relational aggression at similar rates (Card, Stucky, Sawalani, & Little, 2008; Green, Richardson, & Lago, 1996; Marshall, Arnold, Rolon-Arroyo, & Griffith, 2015; Sullivan, Helms, Kliewer, & Goodman, 2010).

Several reasons for these early gender differences have been proposed, including language ability, socialization pressures, and the importance of interpersonal relationships and social status. For instance, relational aggression often requires more verbal sophistication (e.g.,

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to gossip, threaten a peer's status in the friendship; Bonica et al., 2003) and higher verbal abilities to enact this form of aggression. Indeed, studies suggest that children who use relationally aggressive methods early on have higher language abilities, with females generally showing greater verbal abilities than males (Bjorkqvist et al., 1992; Bonica et al., 2003; Cote, Vaillancourt, Barker, Nagin, & Tremblay, 2007). Although all children are socialized not to engage in physically aggressive behavior (Werner & Grant, 2008; Werner, Senich, & Przepyszny, 2006), females are less likely than males to view physically aggressive behavior as acceptable (Rys & Bear, 1997). Instead, females may use relational aggression because it is seen as a normative way to express discontent and/or reach their goals (Werner & Grant, 2008). Moreover, females tend to place greater emphasis on interpersonal relationships, specifically friendships (Lento-Zwolinksi, 2007) and social status within the peer group (Rose, Swenson, & Waller, 2004). As such, studies have found that relational provocations, which could potentially harm child and adolescent relationships, are more harmful and distressing for females than males (Crick, 1995; Crick et al., 2002).

In contrast to relational aggression, physical aggression has an earlier onset, beginning as young as 2 years old (Tremblay et al., 1999) and has clear gender differences, with males showing higher rates than females (Card et al., 2003; Brame, Nagin & Tremblay, 2001; Prinstein et al., 2001). Males who use heightened levels of physical aggression as children are also more likely to engage in physical aggression as adolescents; however, overall rates of physical aggression tend to decrease within adolescence (Brame et al., 2001; Heilbron & Prinstein, 2008).

Literature examining physical aggression has noted reasons why individuals may enact or discontinue the use of physical aggression, namely language abilities, socialization pressures (e.g., peer acceptance) and goal attainment (e.g., enhancing one's social status). Theories of

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physical aggression assert that frustration can lead to aggressive tendencies (Berkowitz, 1989). Lacking the verbal abilities to express frustration could increase aggression and findings support this assertion. Specifically, children with lower verbal skills are found to engage in higher levels of physical aggression (Cote et al., 2007). In adolescence, however, physical aggression is seen as less acceptable, whereas relational aggression is related to more approval (Werner & Hill, 2010) and increased social acceptance (Salmivalli, Kaukiainen & Lagerspetz, 2000). For adolescents, peer groups are broadening to include mixed-gender friendships (La Greca & Harrison, 2005) and males, in particular, may be learning that relationally aggressive methods are effective and covert ways to enact harm. In fact, relational aggression was linked to greater social status in adolescent males and females (Rose et al., 2004). As such, seeing relational aggression as a more acceptable means of causing harm could explain why many studies have found no gender differences among adolescent populations (Card et al., 2008; Green et al., 1996; Marshall et al., 2015; Sullivan et al., 2010).

Contextual Influences on the Development of Relational Aggression

The following section begins by discussing how normative development impacts the development of relational aggression and, subsequently, speaks to important contextual factors that may precipitate or maintain the use of relational aggression in adolescents. Given the unique link between both reactive and relational aggression and internalizing problems, the present study focused on reactive relational aggression and investigated its link specifically to social anxiety. Of note, a major limitation of the current literature is that research often fails to investigate the form and function of aggression together. Consequently, studies assessing reactive relational aggression are limited. As such, subsequent sections will discuss relational

and reactive aggression separately and then speculate how reactive relational aggression could be linked to contextual factors.

Emotional

As reviewed in the previous chapter, the overall ability to regulate the experience and expression of emotions is enhanced in adolescence. At the same time, however, adolescents also experience more intense and labile emotions (Feldman, 2014). As such, they are more easily emotionally aroused, which decreases their ability to control impulses and regulate their emotions (Steinberg, 2005, 2007). Adolescents who engage in relational aggression in a reactive manner may have difficulty regulating their emotions. Though this supposition seems reasonable, most of the available research has targeted younger samples.

Although limited, longitudinal and cross-sectional studies indicate that youth who engage in relational aggression have greater deficits in emotion regulation and more difficulty expressing and tolerating negative emotions. For instance, early adolescents, specifically females, who experience trouble regulating their emotions, are more likely to employ higher levels of relational aggression (Bowie, 2010). Further, youth with higher levels of relational aggression are more hesitant to express their emotions, have greater difficulty coping with sadness (Sullivan, Helms, Kliewer, & Goodman, 2010), and display increased levels of trait anger (Peled & Moretti, 2007). Although adolescents generally tend to experience heightened emotional arousal and lability (Feldman, 2014; Steinberg, 2005), it appears that adolescents who engage in greater levels of relational aggression may also experience more emotional dysregulation, particularly when coping with negative affect (Peled & Moretti, 2007; Sullivan, Helms, Kliewer, & Goodman, 2010).

Similarly, there is a link between emotional dysregulation and reactive aggression. Research suggests that reactively aggressive children and adolescents are less skilled at regulating their emotions (Raine et al., 2006; Rathert, Fite, & Gaertner, 2011). For example, in a longitudinal sample of adolescent males, one study found that reactively aggressive males had greater difficulty with emotion regulation, showed increased anger, impulsivity, and hostility, and experienced greater psychosocial adjustment problems as well (Raine et al., 2006). Additionally, youth who engaged in reactive aggression were more likely to develop internalizing problems, particularly symptoms of social anxiety in adolescence.

Emotion dysregulation appears to be particularly salient in youth who engage in reactive or relational aggression. Anger is a common thread that appears to link both reactive and relational aggression. As such, it may be reasonable to speculate that adolescents who participate in reactive relational aggression are especially at risk for emotional dysregulation and have more difficulty managing their anger, specifically. In fact, one cross-sectional study found that adolescents who engage in reactive relational aggression are more prone to frustration, particularly when they are exerting higher levels of effortful control (e.g., sustained attention, inhibition; Dane & Marini, 2014). As with social anxiety, exerting high levels of control may become too much for some adolescents, who may then act out in aggressive ways. As such, anger dysregulation could be a key factor in the development and use of reactive relational aggression.

Biological

Biological dysfunction has also been linked to both reactive and relational aggression. Studies suggest that youth who engage in greater levels of reactive (Hubbard et al., 2002; Scarpa, Haden, & Tanaka, 2010; Xu, Raine, Yu, & Krieg, 2014) or relational aggression (Gower & Crick, 2011; Murray-Close, Han, Cicchetti, Crick, & Rogosch, 2008; Sijtsema, Shoulbeg, & Murray-Close, 2011) have increased autonomic dysregulation. Few studies, however, focus on middle adolescents (i.e., adolescents 9-12th grade) and instead target children and early adolescents.

As discussed in the previous chapter, cognitive abilities are improving throughout adolescence. Regions in the brain, however, that control behavioral and emotional regulation are still underdeveloped. Consequently, when adolescents are emotionally aroused, brain regions that regulate risky and impulsive behavior are less effective, resulting in higher levels of impulsivity (Steinberg, 2007). As such, it is not surprising that those who engage in aggressive behavior may have greater biological dysregulation. In fact, HPA axis system dysregulation has been associated with relational aggression. For instance, children who engage in greater levels of relational aggression experience less arousal in their autonomic nervous system (i.e., the overarching system that controls the HPA axis response; Gower & Crick, 2011) and blunted cortisol levels (Murray-Close et al., 2008). Together, under arousal and lower cortisol levels may be potential risk factors for later adjustment problems in youth who frequently enact relational aggression (Murray-Close et al., 2008).

There also may be a link between physiological dysregulation and relationally aggressive behavior (Ortiz & Raine, 2004; Raine, Venables, & Mednick, 1997). Research suggests that relationally aggressive children have lower heart rates (Gower & Crick, 2011) and experience

less autonomic reactivity (Sijtsema et al., 2011). Further, using an all-female, cross-sectional sample, Sijtsema and colleagues (2011) found that adolescent females with higher levels of relational aggression showed lower heart rate reactivity and reduced reactivity to stress. Additionally, relationally aggressive females who were more sensitive to rejection experienced higher respiratory sinus arrhythmia reactivity (RSAR). Findings indicate that heart rate reactivity, which is a measure of the sympathetic nervous system and is supposed to increase in response to stress, is blunted. Conversely, RSAR, a measure of the parasympathetic nervous system in charge of calming the body, is heightened suggesting decreased levels of physiological arousal in adolescents who engage in relational aggression (Sijtsema et al. 2011). To further support this notion, skin conductance (i.e., sweating) was also linked to relational aggression in an early adolescent sample. Specifically, relational aggression was associated with blunted skin conductance, particularly when adolescents were faced with a relational provocation (Murray-Close et al., 2014). Overall, research suggests that the overarching autonomic system, to include the HPA axis, seems to be malfunctioning in adolescents with higher levels of relational aggression.

Similar to relational aggression, studies provide some evidence of biological dysfunction in youth who engage in reactive aggression (Hubbard et al., 2002; Scarpa et al., 2010; Xu et al., 2014). In fact, findings parallel research assessing heart rate and relational aggression, wherein children who engage in reactive aggression have lower resting heart rates (Xu et al., 2014) and decreased heart rate variability (Hubbard et al., 2002; Scarpa et al., 2010), which have both been linked to later psychopathology (Scarpa et al., 2010). Reactively aggressive children also experience lower levels of skin conductance than non-aggressive children (Hubbard et al., 2002;

Scarpa et al., 2010). However, when faced with an anger-provoking event, reactively aggressive children have rapid increases in skin conductance (Hubbard et al., 2002).

The literature suggests that youth who engage in relational or reactive aggression tend to experience biological and physiological dysregulation, particularly when feeling angry or perceiving rejection. These same characteristics may be especially likely to occur in adolescents who engage in reactive relational aggression. Further, this tendency to experience greater anger and hypervigilance for rejection may be associated with certain interpretation biases, which could impact the likelihood of whether adolescents employ reactive and relationally aggressive methods.

Cognitive

Teens engage in egocentric thinking, which often results in greater self-consciousness and the belief that others are evaluating them (Gray & Hudson, 1984; Vartanian, 2000). Self-consciousness coupled with concerns of evaluation may lead to cognitive biases (e.g., interpretation biases) in adolescents with higher levels of reactive relational aggression. Adolescents who use reactive or relational aggression may have more difficulty interpreting ambiguous social situations and use less adaptive coping strategies, like rumination. In fact, hostile attributions for ambiguous social situations (i.e., intent attributions) and rumination, particularly about situations that create anger, have been linked to reactive (Arsenio, Adams, & Gold, 2009) and relational aggression (Crick, 1995; Crick et al., 2002; Godleski & Ostrov, 2010; Mathieson et al., 2010; Peled & Moretti, 2007; 2011). Although it is not the focus of the current study, intent attributions are a mainstay in the aggression literature. As such, intent attributions will be briefly discussed within the current section. Rumination will be addressed in the subsequent section.

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Much of the research examining cognitive biases and aggression is based on the Social Information-Processing (SIP) model developed by Crick and Dodge (1994). The SIP model is a staple within the developmental literature to describe cognitive distortions that occur in youth with aggressive tendencies. This social-cognitive model suggests that individuals first encode a cue and then interpret the cue itself. However, emotional arousal can influence how an individual perceives a situation, which may alter the accuracy of this interpretation. As a result, intent and causal attributions can be made at this stage. In fact, studies indicate that aggressive youth often experience pitfalls at the interpretation stage of the model, wherein they misinterpret cues and tend to attribute more hostile intent to the motives of their peers, especially in ambiguous situations (Crick, 1995, 2002; Dodge & Somberg, 1987).

This is also true of relationally aggressive youth (Crick, 1994). For instance, children who engage in relational aggression make significantly more hostile intent attributions for relational provocations than their nonaggressive peers (Crick, 1995; Godleski & Ostrov, 2010). Females also report greater levels of distress as compared to males in response to relational provocations (Crick et al., 2002). Further, relational aggression appears to be linked to hostile attribution biases, but only when relational victimization (i.e., being victimized by relationally aggressive methods) and emotional distress are high in children (Mathieson et al., 2010). Thus, emotional distress may be a catalyst that precipitates maladaptive coping strategies, leading children to enact relational aggression.

Similar findings have been observed in reactive and reactive relational aggression. Adolescents who engage in higher levels of reactive aggression show greater hostile attributions biases (Arsenio et al., 2009) and females who employ reactive relational aggression experience greater state anger in response to ambiguous provocations (Marsee & Frick, 2007). Further, in a

study with young adults, those who engaged in increased reactive relational aggression experienced greater hostile attribution biases, particularly in situations involving relational provocations (Bailey & Ostrov, 2008).

Overall, findings provide a clear link between reactive relational aggression and hostile attributions. Interestingly, many of these hostile attributions arise in peer interactions (Arsenio et al., 2009; Marsee & Frick, 2007). Peers are becoming increasingly important in an adolescent's daily life (Feldman, 2014). The tendency for relationally aggressive adolescents to expect and perceive greater hostile intent by peers in ambiguous social situations may lead to greater difficulties building and maintaining friendships.

Social

Parents continue to play a key role in adolescents' lives, but teens' reliance on peers is increasing and peer relationships are highly influential (Feldman, 2014). Adolescents increasingly care about the opinions and views of their peers and strive to fit in (Detweiler et al., 2014; LaFontana & Cillessen, 2010). The peer group and dyadic friendships are critical to adolescent social functioning and the development of later relationships (La Greca & Harrison, 2005). Although not the focus of the current study, it is important to discuss social factors that may impact the use of relational aggression in adolescents. As such, the review will briefly discuss the intersection between relational and reactive aggression and social relationships.

Relational aggression has been consistently linked to social factors in adolescents, particularly within the context of friendships and romantic relationships. Research indicates that early adolescents that engage in relational aggression tend to select friends who are similar to them and relational aggression is also learned and adopted from friends (Sijtsema et al., 2009). Relational aggression also predicts increases in friendship quality among adolescents who

participate in relational aggression with a mutual best friend. Specifically, engaging in higher levels of relationally aggressive talk with a mutual best friend predicts an increase in the friendship quality over time (Banny, Ames, Heilbron, & Prinstein, 2011). These findings may suggest that relationally aggressive adolescents form friendships with others that are also relationally aggressive, and, perhaps, these adolescents band together with friends to gossip and exclude others, which creates more exclusive friendships. Research supports this assertion, as youth who engage in reactive relational aggression with friends have more exclusive friendships (Grotpeter & Crick, 1996; Kawabata, Crick, & Hamaguchi, 2010; Lento-Zwolinski, 2007).

Although the use of relational aggression seems to have a positive side, it also can be detrimental to social relationships. For instance, relational aggression appears to serve a purpose, as adolescents are able gossip about others with friends (Banny et al., 2011) and adolescents who engage in greater relational aggression tend to enjoy high social status (i.e., perceived as more popular and dominant by peers; Prinstein & Cillessen, 2003) within their peer group (Rose et al., 2004). However, relationally aggressive adolescents are less well-liked by their peers overall (Prinstein & Cillessen, 2003). As such, there is a less positive side to relational aggression, particularly when it is used against friends. For example, early adolescent girls who reported using relational aggression also reported using it more within their friendships, resulting in greater conflict and betrayal (Grotpeter & Crick, 1996). Further, adolescents who employ relational aggression against a friend are likely to believe the friend would be hurt and then retaliate against them (Goldstein & Tisak, 2004). Not surprisingly, children who use relational aggression within their friendships are more likely engage in friend victimization (Kawabata et al., 2010), which is defined as harassment/abuse resulting in a lack of security or trust within the relationship (Ladd, Kochenderfer, & Coleman, 1997). This finding is troubling, as research also

shows that victims of relational aggression tend to have higher rates of loneliness, depression and social anxiety, showing this type of relationship can be maladaptive (Grotpeter & Crick, 1995).

Similar findings have been reported for romantic relationships (Linder, Crick, & Collins, 2002). Adolescents, particularly females, in peer groups that condone relational aggression are more likely to engage in relational aggression within their romantic relationships (Ellis, Chung-Hall, & Dumas, 2013). Young adults who engage romantic relational aggression (i.e., use relational aggression against their significant other) have greater socio-emotional difficulties (Linder, Crick, & Collins, 2002). In fact, young adults who used romantic relational aggression, or were victimized using relational aggression, reported more frustration, jealousy, and lower levels of trust within the relationship (Linder et al., 2002). These individuals also tended to be ambivalent about, but also anxiously clingy to, their partner. Overall, findings suggest that relational aggression both in friendships and romantic relationships creates increased conflict and negative feelings, and may even contribute to later psychopathology.

Relatively less research has been conducted on reactive or reactive relational aggression and social relationships. Although limited, evidence suggests that youth who employ reactive or reactive relational aggression appear to have increased psychosocial adjustment problems. For instance, youth who engage in reactive aggression have fewer close friends (Raine et al., 2006) and are more negatively evaluated, socially isolated (Fite, Rathert, Colder, Lochman, & Wells, 2011), and rejected by their peers (Poulin & Boivin, 2000). Similar findings have been obtained for youth who engaged in reactive relational aggression. Specifically, these youth have higher social status, but are disliked by peers, likely due to using relational aggression against these peers (Prinstein & Cillessen, 2003). They also have higher rates of internalizing problems

(Mathieson & Crick, 2010). Overall, findings suggest that those who engage in reactive or relational aggression have more tumultuous relationships and are often rejected by peers.

CHAPTER III

SOCIAL ANXIETY AND REACTIVE RELATIONAL AGGRESSION

As reviewed, there are several underlying factors related to both social anxiety and reactive and relational aggression, including anger dysregulation (Erwin et al., 2003; Peled & Moretti, 2007; Suveg & Zeman, 2004; Zeman et al., 2002), HPA axis dysfunction (Murray-Close et al., 2008; Scarpa et al., 2010; van West et al., 2008), and increased rumination (Asband et al., 2016; Jose et al., 2012; Peled et al., 2007; 2010; Trew & Alden, 2009). As such, it is not surprising that studies have found a link between social anxiety and relational aggression (Batanova & Loukas, 2011; Gros, Gros, & Simms, 2010; Storch, Bagner, Geffken, & Baumeister, 2004). In fact, research indicates that instead of suppressing their anger (Erwin et al., 2003), those with social anxiety may express their discontent in more covert ways through relational aggression. Much of this research, however, focuses on early adolescents (age 10-14) and young adults (e.g., Bagner, Storch, & Prestor, 2007; Batanova & Loukas, 2011; Storch et al., 2004), leaving a gap in the literature when it comes to middle adolescents (14-17 years old).

This is unfortunate, as middle adolescence is an important period of development. Adolescents in general are grappling with many emotional, cognitive, and social challenges (Feldman, 2014), but middle adolescents, in particular, are at higher risk for developing internalizing symptoms (Kashdan & Herbert, 2001) and often engage in relationally aggressive behavior (Marshall et al., 2015; Prinstein & Cillessen, 2003). Social anxiety is increasingly prevalent amongst middle adolescents (Essau et al., 1999; Kashdan & Herbert, 2001) and relational aggression is a normative way for these youth to express negative emotions (Prinstein & Cillessen, 2003). However, little is known about the mechanisms that may explain the relationship between social anxiety and reactive relational aggression. The current study aims to

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directly assess social anxiety and reactive relational aggression in middle adolescents and further examine some cognitive and emotional correlates that could help to explain the expected link between them. A depiction of these hypothesized relationships can be seen in *Figure 1*. The following section reviews literature examining the relationship between social anxiety and reactive relational aggression. Subsequently, it will propose potential mechanisms underlying this link and lay out the hypotheses of the current study.

Putative Links

In the last two decades, research has suggested that socially anxious individuals engage in reactive and relational aggression, perhaps as a way to express anger or displeasure towards others. In early adolescent and college-aged samples, symptoms of social anxiety uniquely and positively predict relational aggression (Gros et al., 2010; Loukas, Paulos, & Robinson, 2005; Storch et al., 2004) and socially anxious young adults use relational aggression within their romantic relationships and friendships (Bagner et al., 2007; Hanby et al., 2012). Two studies have examined the relationship between social anxiety and relational aggression in early adolescents. For example, in a cross-sectional study, Loukas and colleagues (2005) assessed social anxiety, relational aggression and parenting responses in early adolescents aged 10-14. Both males and females with higher levels of social anxiety exhibited greater levels of relational aggression, which was further mediated by maladaptive parenting responses (e.g., invalidating emotions, blaming, and withdrawing love/support). Moreover, a 1-year longitudinal study added to Loukas and colleagues' findings by examining relational aggression, social anxiety, and empathy in early adolescents aged 10-14 (Batanova & Loukas, 2011). A unique and significant link between social anxiety and relational aggression was found when adolescents showed lower levels of empathy. However, this relationship was not significant at high levels of empathy.

Similar findings were seen in a college-age sample, wherein young adults with greater fears of negative evaluation and poorer perspective-taking skills/empathy were more likely to use relational aggression (Loudin, Loukas, & Robinson, 2003). Prior findings suggest that youth who experience greater symptoms of social anxiety and less emotional awareness may be more likely to react in covert and damaging ways.

Social anxiety is also associated with reactive aggression in children and adolescents (Raine et al., 2006; Xu & Zhang, 2008) as well as college-aged samples (Howell et al., 2014). For example, in an all-male, longitudinal sample, Raine and colleagues (2006) assessed aggression, behavioral problems, trait anxiety, and symptoms of social anxiety in males at age 7 and again at age 16. Results indicated that reactive aggression at age 7 was related to symptoms of social anxiety at age 16. Findings suggest that socially anxious adolescents who engage in reactive aggression early on, may be at risk for internalizing symptoms in adolescence. The connection between social anxiety and reactive aggression was further explored in a cross-sectional study examining emotion regulation, social anxiety, and the function of aggression (i.e., reactive, proactive) in Chinese children (4th and 5th graders). Findings showed similar patterns to Raine and colleagues' study. Reactive, but not proactive aggression, positively and uniquely predicted social anxiety. Children with social anxiety who engaged in reactive aggression also had greater emotion regulation deficits. Similar to relational aggression, socially anxious youth who engage in reactive aggression appear to have emotion regulation deficits that fuel aggressive behavior. They are also more likely to engage in reactive aggression when feeling threatened. For instance, in one cross-sectional study, social anxiety, reactive aggression, and honor threats (e.g., being rumored to show less masculine traits, such as not standing up for oneself, lacking assertiveness) were examined in two undergraduate samples at northern and southern universities

in the United States (Howell et al., 2014). Findings indicated that southerners, but not northerners, with heightened social anxiety were more likely to reactively aggress against others if they felt threatened. In addition, females from southern universities were less reactively aggressive than their male counterparts when social anxiety was not present. However, no gender differences in reactive aggression were found when social anxiety was high (Howell et al., 2014). Results suggest socially anxious young adults tend to be more hypervigilant of perceived social threats precipitating greater use of reactive aggression.

Although the literature has shown a link between social anxiety and relational aggression and social anxiety and reactive aggression, research has yet to combine both the form and function of aggression to assess the relationship to social anxiety. Only one cross-sectional study has combined the form and function of aggression in relation to more generalized anxiety in youth (age 6-17). Marsee and colleagues (2007) assessed reactive relational aggression, general anxiety and social cognitive errors in youth. Findings indicated that general anxiety was significantly related to reactive relational aggression. Furthermore, anxious youth were more likely to engage in reactive relational aggression if they also made negative interpretations of ambiguous social situations. Adolescent males with higher levels of anxiety also engaged in more reactive relational aggression than females with high anxiety. Findings further delineate patterns of maladaptive cognitive coping styles (e.g., interpretation biases/hypervigilance to social threat) in socially anxious adolescents, which leads to aggressive behavior (Marsee et al., 2007).

Overall, results suggest that social anxiety is related to both reactive and relational aggression in child, early adolescent and young adult samples and this association is particularly salient when socially anxious youth feel threatened. Fear of negative evaluation may be a

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precipitating factor for the increased use of reactive relational aggression. However, to date no studies have examined the link between social anxiety or fear of negative evaluation and reactive relational aggression (see *Figure 1,* path C).

Potential Explanations for this Link

Two explanations for the link between social anxiety and aggression have been offered. Those with higher levels of aggression and social anxiety may be part of a "disinhibited subtype" or may lack self-regulation (Kashdan et al., 2008; Kashdan & Hofmann, 2008; Muraven & Baumeister, 2000). Kashdan and colleagues (2008) suggest that socially anxious adults who engage in aggressive or risky behaviors may be part of a disinhibited subtype of social anxiety (Kashdan et al., 2008). Research has supported this assertion and suggests some important distinctions between traditionally inhibited and disinhibited socially anxious groups (Kashdan, McKnight, Richey, & Hofmann, 2009). Typically, many individuals with social anxiety (59-79%) are classified as behaviorally inhibited, withdrawn, and risk averse. However, studies indicate a subgroup of socially anxious individuals are less inhibited (21-41%; Kashdan & McKnight, 2010). Within the disinhibited group, socially anxious adults tend to seek out new experiences and engage in higher levels of risky behaviors (e.g., frequent unsafe sexual activity, aggression, substance use). In addition, they have trouble regulating their emotions, greater hostile impulses (Kashdan, McKnight, Richey, & Hofmann, 2009), increased anger, and poorer emotional awareness (Kachin, Newman, & Pincus, 2001; Kashdan et al., 2008). Further, these individuals are at increased risk for several maladaptive outcomes, including poorer mental and physical health, less education, lower socioeconomic status, earlier onset of social anxiety, higher risk for comorbidities, lower self-reported quality of life, and a lower likelihood of seeking or completing mental health treatment (Kashdan, McKnight, Richey, & Hofmann, 2009).

In addition to this disinhibited subtype, or perhaps in tandem with it, Kashdan and colleagues (2008) have posited that the self-regulatory model (Muraven & Baumeister, 2000) could explain why some socially anxious individuals are more impulsive and show angry/aggressive tendencies (Kashdan & Hofmann, 2008). The self-regulatory model is informed by the limited strength model, which suggests that self-regulation is a limited resource. Effortful control of self-regulation (e.g., actively trying to control attention, manage stress or negative affect) depletes cognitive resources for subsequent tasks that also require self-control (Muravan, Tice, & Baumeister, 1998). Empirical work supports this assumption. For instance, young adults who were asked to control and inhibit their natural emotional state showed later decreases in self-control (Muravan & Baumeister, 2000). The depletion of self-control is also present in those with heightened anxiety (Suveg & Zeman, 2004), ruminative thoughts, and aggressive behavior (Muravan et al., 1998). These findings may suggest that anxiety and ruminative coping strategies may expend self-regulatory resources, which could result in more impulsive behaviors like aggression.

In summary, a depletion of self-regulatory resources may lead to difficulties in controlling and managing negative affect (Muravan & Baumeister, 2000; Muravan et al., 1998). As a result, socially anxious youth may have more difficulty regulating and controlling their anger and thereby engage in increased reactive relational aggression. Notably, however, this has not been tested with socially anxious adolescents and few studies have focused on underlying mechanisms that could explain the link between social anxiety and reactive relational aggression (e.g., Howell et al., 2014; Loudin et al., 2003; Marsee et al., 2007).

Potential Mechanisms of this Link: Anger and Anger Rumination

Anger and rumination are two constructs that may be particularly important in explaining why social anxiety and reactive relational aggression might be linked. Research examining these constructs, however, is limited. The current section will provide a summary of the research and subsequently speculate on how these constructs could be related.

Rumination, focused on situations that create anger (i.e., anger rumination), is associated with social anxiety (Trew & Alden, 2009; Weber et al., 2004) and reactive and relational aggression (Peled & Moretti, 2007; 2010; White & Turner, 2014). Anger rumination is defined as ruminating about past or present anger-provoking situations or the causes or consequences of that anger-provoking experience (Sukhodolsky, Golub, & Cromwell, 2001). Researchers note that anger rumination may also act to intensify feelings of anger (Anestis, Anestis, Selby, & Joiner, 2009; Peled & Moretti, 2007; 2010; Sukhodolsky et al., 2001). Further, in a cross-sectional, community sample of young adults and a clinical sample of middle adolescents, trait anger and anger rumination were independent and positive predictors of relational aggression (Peled & Moretti, 2007; 2010). Adolescent girls experienced increased anger rumination as compared to boys (Peled & Moretti, 2007), however, these same researchers failed to find gender differences in their undergraduate sample (Peled & Moretti, 2010). Given these mixed findings, the current study assessed gender differences in anger rumination in middle adolescents.

Anger rumination is also associated with reactive aggression (White & Turner, 2014). Specifically, reactive aggression was linked to anger rumination in a young adult sample and this relationship was further mediated by effortful control (White & Turner, 2014). Results may suggest that those who engage in ruminative coping strategies may deplete their self-regulatory resources and, as a result, may engage in more reactive aggression. As such, anger rumination,

specifically, may be a potential mediator to explain why those with high levels of social anxiety engage in reactive relational aggression (see *Figure 1,* paths A and B).

As previously discussed, anger is related to anxiety and internalizing disorders in children (Suveg & Zeman, 2004; Zeman et al., 2002) and to social anxiety in adults (Erwin et al., 2003; Kachin et al., 2001; Kashdan et al., 2008; Weber et al., 2004). Trait anger is also associated with anger rumination (Peled & Moretti, 2007; 2010; Sukhodolsky et al., 2001) and reactive and relational aggression (Peled & Moretti, 2007). As such, it appears that youth with social anxiety, anger rumination, and reactive and relational aggression may have more difficulty with regulating their anger. Therefore, it seems reasonable to speculate that anger or the ability to regulate anger is an important moderator. Adolescents who express increased trait anger may ruminate more about these angry experiences and as a result, may be more likely to employ reactive relational aggression (see *Figure 1,* path D).

Overall, findings suggest that youth with higher levels of social anxiety and reactive and relational aggression appear to have difficulty regulating their emotions, particularly anger, and ruminate about these angry experiences. Although we have some knowledge of how reactive and relational aggression are linked to anger rumination, studies have not examined the association among reactive relational aggression, social anxiety and anger rumination.

Figure 1. Moderated-Mediation Model
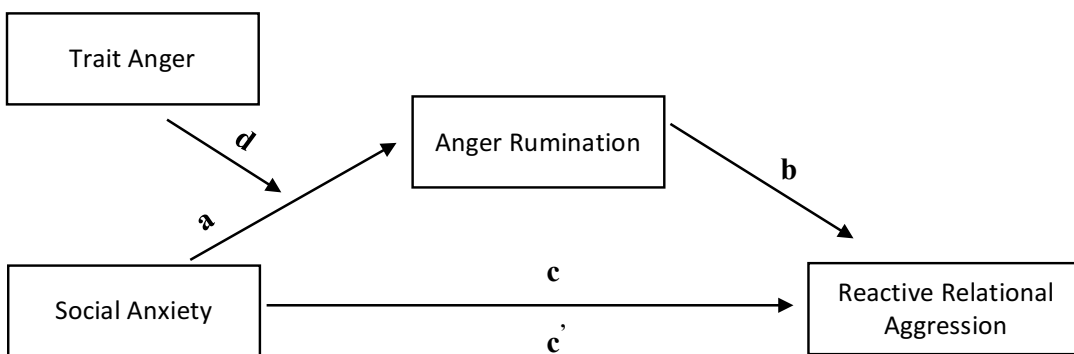
Study Hypotheses

Given the link between social anxiety and reactive relational aggression in adolescents, as well as college samples (Bagner et al., 2007; Gros et al., 2010; Hanby et al., 2012; Kashdan et al., 2008; Kashdan et al., 2009; Loudin et al., 2003; Loukas et al., 2005; Storch, Bagner et al., 2004), it was hypothesized that adolescents with higher levels of social anxiety would engage in increased levels of reactive relational aggression (Hypothesis 1). Further, adolescents with higher levels of social anxiety were hypothesized to experience higher levels of trait anger (Hypothesis 2) and anger rumination (Hypothesis 3), consistent with prior literature (Erwin et al., 2003; Kachin et al., 2001; Kashdan et al., 2008; Peled & Moretti, 2007; 2011; Weber et al., 2004)

Reactive relational aggression was hypothesized to positively related to trait anger (Hypothesis 4) and anger rumination (Hypothesis 5), consistent with previous research (Marsee & Frick, 2007; Peled & Moretti, 2007; 2011; Sukoldowsky, 2001). Lastly, it was hypothesized that adolescents with higher levels of social anxiety would exhibit increased levels of reactive relational aggression through the use of anger rumination, but only those with higher levels of trait anger (Hypothesis 6). See *Figure 1* above.

Gender

Mean-level gender differences across all constructs were explored. Consistent with prior research (Essau et al., 1999; Kashdan & Herbert, 2001), symptoms of social anxiety were predicted to be higher in females than males (Hypothesis 7). Besides social anxiety, literature examining gender amongst the remaining study constructs is either limited (i.e., trait anger) or conflicting (i.e., anger rumination and reactive relational aggression; Card & Little, 2003; 2006; Marshall et al., 2015; Peled & Moretti, 2007; 2010). As such, exploratory gender analyses were performed. Mean-level gender differences amongst trait anger, anger rumination, and reactive

relational aggression were assessed. Additionally, the prediction that socially anxious teens would engage in reactive relational aggression as a function of anger rumination, but only in adolescents with high levels of trait anger, was further probed by assessing whether this model differed by gender.

Alternative Models

Research indicates that social anxiety and depression are often comorbid amongst adolescents. Some studies (e.g., Starr & Davila, 2008) have suggested the importance of considering the covariance between social anxiety and depressive symptoms. In the context of the current study, literature also suggests that relational aggression predicts depression, as well as social anxiety (Storch et al., 2004), suggesting that depression, too, may be linked to reactive relational aggression. However, there is no known research assessing whether depressed adolescents engage in greater levels of reactive relational aggression. As such, a conditional process analysis explored whether anger rumination was one mechanism through which depressed teens engaged in greater levels of reactive relational aggression, particularly in teens with higher levels of trait anger. Further, relational and physical aggression also tend to frequently co-occur and studies indicate relational and physical aggression are positively and moderately correlated (Little et al., 2003; Prinstein et al., 2001). Research with undergraduate samples has found that fear of negative evaluation is linked to both relational and physical aggression (Hanby et al., 2012; Storch et al., 2004). However, literature with early adolescent samples has only found a relationship between social anxiety and relational aggression, but not physical aggression (Batanova & Loukas, 2011; Loukas et al., 2005). As such, a conditional process analysis was conducted to assess whether social anxiety was specifically related to one form of aggression in adolescents.

CHAPTER IV

METHODS

Participants

One hundred and five teens between the ages of 14 and 17 years were invited to participate in the current study through their local high school in Maine or their community (both in-state and out of state). Community participants were recruited through announcements on university-wide email folders, flyers distributed throughout the community, and advertisements via Facebook (Appendices A, B, C, and D). Adolescents who participated from the community received a $10.00 Amazon gift card for their participation. In regards to school recruitment, school administrative staff were contacted directly by phone or email and provided with details of the study (Appendices E, F). Adolescents participating through their local high school were entered into a raffle for one of three, $50.00 Amazon gift cards, per school, as an incentive to increase parental consent return rates. All teens who participated in the study also received a $5.00 gift card from Target. The principal investigator worked closely with the administration at each school to adhere to all school policies in conducting research and data collection.

Sample Characteristics

The sample consisted of 64 females (61%) and 36 males (34.3%). Three participants were unsure of their gender identity (2.9%) and two showed missing gender data (1.9%). Further, of the total sample, 71 participants were recruited from the community (67.6%) and 34 (32.4%) were recruited from their local high school. Teens ranged in age from 14 to 17 (M_{age} = 15.43; *SD* = 1.17). The majority of participants identified as White (84.6%). The remaining participants identified as Asian (6.7%), Latino/a (2.9%), Biracial (2.9%), American Indian/Native American

(1.9%) and Black (1%). Most participants reported being in 9th grade (41.9%), with 16.5% in 10th, 26.2% in 11th, and 14.6% in 12th grade.

<div align="center">

Measures

</div>

Primary Measures

  Demographics. *Demographic questionnaire* (see Appendix G). Participants were asked to fill out a questionnaire assessing age, grade, school name, gender identity, race, and sexual orientation. The demographic information was used to describe the sample and examine potential group differences. Group means and standard deviations are provided in Table 1.

  Social Anxiety. *Social Anxiety Scale for Adolescents* (SAS-A; Appendix H). Social anxiety was measured using the Social Anxiety Scale for Adolescents (La Greca & Lopez, 1998). SAS-A is a 22-item self-report measure containing four filler items and 18 descriptive self-statements. Items are rated on a five-point Likert scale from *not at all* (1) to *all the time* (5). The items encompass three factors: fear of negative evaluation (FNE; e.g., "I worry about what others think of me"), social avoidance and distress with new social situations or unfamiliar peers (SAD-N; e.g., "I get nervous when I talk to peers I don't know very well"), and more pervasive social avoidance and distress (SAD-G; e.g., "I feel shy even with peers I know well"). The SAS-A has demonstrated adequate internal consistency (α's range from .70-.91) and validity (e.g., related to measures of anxiety and depression) with high school aged adolescents in community and school samples (Inderbitzen-Nolan & Walters, 2000; La Greca & Lopez, 1998; Myers, Stein, & Aarons, 2002). For the current sample, the measure showed good internal consistency for the total ($\alpha = .95$) and subscale scores (α's ranging from .82-.94). The total score was used for the current study. Possible scores ranged from 18 to 90. High scores on the scale indicate increased levels of social anxiety.

Aggression. *Peer Conflict Scale* (PCS; Appendix I). Reactive relational aggression was examined using the Peer Conflict Scale, which is a 40-item, self-reported measure of aggression in children and adolescents (Marsee & Frick, 2007). The measure contains four subscales: proactive physical (e.g., "I start fights to get what I want"), proactive relational (e.g., "I gossip about others to become popular"), reactive physical (e.g., "When someone hurts me, I end up getting into a fight"), and reactive relational (e.g., "If others make me mad, I tell their secrets"). All items are rated on a four-point Likert scale from *not at all true* (0) to *definitely true* (3).

The PCS has demonstrated good internal consistency (α's ranging from .76-.88) and validity (e.g., subscales were related to externalizing problems) with adolescents (12-19 years old) in school and community samples (Marsee, Barry, Childs, Frick, Kimonis, Munoz…Lau, 2011; Marsee, Weems, & Taylor, 2008). Internal consistency for the current sample was also found to be adequate (α's ranging from .70-.80). Items in each subscale are summed to obtain a total subscale score, with each subscale ranging from 0 to 30. Total subscale scores were calculated for only reactive relational and reactive physical aggression scales. Higher scores indicate greater reactive relational or reactive physical aggression.

Since relational and physical aggression are moderately correlated (Fite, Stauffacher, Ostrov, & Colder, 2008; Card & Little, 2006; Little et al., 2003) reactive physical aggression will be assessed in an alternative model to determine whether this subtype of aggression may account for differences among social anxiety, reactive relational aggression, anger, and anger rumination (see *Figure 6*).

Cognitive and Emotional Correlates. *Anger Rumination Scale* (ARS; Appendix J).

Anger rumination was assessed using the Anger Rumination Scale, which was developed to examine cognitive processes that occur after anger is triggered or generated in young adults (Sukhodolsky, Golub, & Cromwell, 2001). Though designed for young adults, the ARS has been used with adolescents as young as 16 (Anestis et al., 2009). The ARS is a 19-item, self-report questionnaire that assesses the tendency to think about past episodes of anger, pay attention to angry affect, and ruminate about the causes and consequences of anger episodes. Items are rated on a four-point scale, ranging from *almost never* (1) to *almost always* (4). The items encompass four factors: angry afterthoughts (e.g., "Whenever I experience anger, I keep thinking about it for a while"), angry memories (e.g., "I ruminate about my past anger experiences"), thoughts of revenge (e.g., "I have difficulty forgiving people who have hurt me"), and understanding of causes (e.g., "I analyze events that make me angry"). The ARS has shown acceptable internal consistency (α's ranging from .72-.86) and validity (e.g., related to anger and negative affect) across young adult samples (Maxwell, Sukhodolsky, Chow, & Wong, 2005; Sukhodolsky et al., 2001). Similar internal consistencies were found in the current study (α's ranging from .70-.95). Possible scores ranged from 19 to 76. Only the total score was used for the current study. High scores on the scale indicate an increased tendency toward anger rumination.

State-Trait Anger Expression Scale for Children and Adolescents--Second Edition (STAXI-2 C/A; Appendix K). Trait anger was examined using the State-Trait Anger Expression Scale for Children and Adolescents (Brunner, 2004; Brunner & Spielberger, 2009), which is a 35-item, self-report survey that examines state and trait anger, as well as anger expression and control in children and adolescents, 9-18 years old. Items are rated on a three-point Likert scale from *not at all* (1) to *very much* (3) or *hardly ever* (1) to *often* (3). The measure can be used with

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clinical and non-clinical samples and contains five scales: state anger ("I feel like throwing something"), trait anger ("I get angry quickly"), anger expression-out ("I get into arguments"), anger expression-in ("I hide my anger") and anger control ("I try to calm my angry feelings"). It also includes four subscales: state anger-feelings, state anger-expression, trait anger-temperament and trait anger-reaction. The STAXI-2 C/A has acceptable internal consistency (α's ranging from .70-.87) and validity (e.g., positively related to aggression and externalizing behavior) with adolescent populations and across gender (Brunner, 2004; Brunner & Spielberger, 2009). The current study only used the trait anger scale (scores ranging from 10-30), which also showed good internal consistency ($\alpha = .85$). High scores on the trait anger scale indicated greater levels of trait anger.

Secondary Measures

      Depression. *Children's Depression Inventory* (CDI; Appendix L). Depression was examined using the Children's Depression Inventory. The CDI is a 27-item self-report measure that assesses cognitive, affective and behavioral symptoms of depression in youth ages 7 to 17 years (Kovacs, 1981; 1992). Participants are asked to choose the statement (from three choices) that best describes them over the past two weeks (e.g., "I am sad once in a while," "I am sad many times," "I am sad all the time"). Responses to each item are scored on a three-point Likert scale indicating *absent symptoms* (0) to *symptoms present most of the time* (2). During a pilot of the current study, some school personnel noted concerns regarding inclusion of the suicidal ideation item. As such, a decision to remove item 9 on the CDI, which assesses suicidal ideation, was made. This decision is consistent with many studies examining depressive symptoms among youth (Shochet, et al., 2001; Stopa, Barrett, & Golingi, 2000; Weiss et al., 1991).

Overall, the CDI demonstrated excellent internal consistency (α = .92; Gullone & Taffe, 2011) and validity in community and school samples (Cole, Peeke, Martin, Truglio, & Seroczynski, 1998; Kovacs, 1992). The current sample also showed excellent internal consistency (α = .93). Importantly, the omission of the suicide item has not been shown to have an adverse impact on the factor structure or psychometric properties of the measure (Stopa et al., 2000; Weiss et al., 1991). Only the total score (possible scores ranging from 26-78) was computed for the current study. Social anxiety and depression frequently co-occur among youth and some research (e.g., Starr & Davila, 2008) suggests that it is important to consider the covariance between the symptoms. As such, depressive symptoms were measured in order assess whether connections among social anxiety and reactive relational aggression, trait anger, and anger rumination were also explained by depression (see *Figure 5)*.

Procedure

In regards to school recruitment, school personnel were contacted to inform them of the study (Appendix E, F). Consents were then mailed out to parents by school personnel, sent home with students, or sent to parents electronically by school personnel (Appendix M). Parents returned consents to appointed school personnel, sent the consent to the principal investigator via a postage paid envelope, or emailed the principal investigator to consent. If emailing the principal investigator, parents were asked to provide their child's full name, specify whether the child can or cannot participate, and provide their child's email address to allow the study link to be sent. For community recruitment, parents contacted the principal investigator via phone or email to indicate interest. If interested, parents were informed of the study (Appendix D) and then sent a password protected link to fill out the parental consent via Qualtrics (Appendix N), an

online site used to facilitate data collection that has been used by previous studies conducted by the Department of Psychology.

Participants were involved in one, approximately 30-minute *anonymous* data collection session, which was completed during a scheduled school period or at home. Adolescents who received parent consent, completed assent (Appendices O, P) and all questionnaires online via Qualtrics. Participants were *not* asked to provide their name on the online survey in order to maintain anonymity. Teens were informed that it is their right to skip any questions they do not want to answer and they can terminate participation at any time. At the conclusion of the survey, participants were provided with a statement thanking them for their participation (Appendix Q, R) as well as a resource list (Appendix S). Adolescents were then asked to click on a link taking them to a separate Qualtrics survey, which was not linked to their survey answers, to provide their name and email address to receive compensation for the study (Appendix T, U).

CHAPTER V

RESULTS

Preliminary Analyses

Descriptive statistics and correlations

Means, standard deviations, and correlations for study measures can be found in Table 1. Detailed descriptions of specific relationships amongst study variables will be reviewed in more detail in subsequent sections when discussing specific hypotheses. Briefly, in line with hypotheses, all primary variables were positively and significantly correlated. Social anxiety total score was positively and significantly correlated with trait anger, anger rumination, and reactive relational aggression. Additionally, trait anger showed a positive and significant relationship with anger rumination and reactive relational aggression. A significant and positive relationship was found between anger rumination and reactive relational aggression. Finally, the depression total score was also positively and significantly correlated with social anxiety, trait anger, anger rumination, and reactive relational aggression.

Table 1

Means, Standard Deviations and Correlations amongst Study Variables

Measure	*1*	*2*	*3*	*4*	*5*
1. Social Anxiety Total Score	--	--	--	--	--
2. Trait Anger	.62	--	--	--	--
3. Anger Rumination Total Score	.61	.68	--	--	--
4. Reactive Relational Aggression	.31	.39	.38	--	--
5. Depression Total Score	.67	.57	.71	.29	--
M *(SD)*	54.69 *(3.98)*	19.09 *(4.52)*	35.48 *(12.62)*	2.92 *(3.17)*	40.64 *(10.21)*

Note. $p < .01$

Gender analyses. Exploratory gender analyses using independent samples t-tests were completed for the current study to assess mean-level gender differences. Gender differences were found for social anxiety [$t(96) = 3.37, p = .001$], with females showing higher rates of social anxiety ($M = 58.67, SD = 15.62$) than males ($M = 46.79, SD = 18.33$) consistent with Hypothesis 7. Gender differences were also found for anger rumination [$t(95) = 2.09, p = .039$], with females showing greater levels of rumination ($M = 36.70, SD = 13.22$) than males ($M = 31.35, SD = 10.16$). No significant gender differences were found for reactive relational aggression [$t(96) = .85, p = .399$] or trait anger [$t(98) = 1.39, p = .168$].

Means, standard deviations, and correlations for primary measures by gender can be found in Table 2. For females, social anxiety total score was positively and significantly correlated with trait anger and anger rumination, but not reactive relational aggression. Further, trait anger and anger rumination were significantly and positively linked to each other and to reactive relational aggression. For males, social anxiety total score was significantly associated with trait anger, anger rumination, and reactive relational aggression. Additionally, trait anger and anger rumination were significantly and positively associated with one another. Anger rumination, but not trait anger, was significantly associated with reactive relational aggression for males.

Table 2

Means, Standard Deviations and Correlations amongst Primary Variables by Gender

Measure	*1*	*2*	*3*	*4*
1. Social Anxiety Total Score	--	.61**	.57**	.22
2. Trait Anger	.64**	--	.69**	.31*
3. Anger Rumination Total Score	.67**	.69**	--	.34**
4. Reactive Relational Aggression	.49**	.25	.50**	--
Females: M *(SD)*	58.67 *(15.62)*	19.55 *(4.45)*	36.70 *(13.22)*	2.98 *(3.14)*
Males: M (*SD*)	46.79 *(18.34)*	18.22 *(4.80)*	31.35 *(10.16)*	2.43 *(3.05)*

Note. **$p < .010$, *$p < .050$. Correlations for females can be found on the top half of the table, correlations for males are found on the bottom half of the table.

Analyses of Study Hypotheses

Preliminary Data Analysis

Prior to conducting the primary analyses of interest, data were examined for univariate and multivariate outliers. Univariate outliers were defined as z-scores above ± 3.29 (see Tabachnick & Fidell, 2013, p. 73) and were addressed in the current study by utilizing data transformation procedures. Winsorizing, a transformation technique that involves changing extreme scores to the next highest score that is not an outlier, was used in the current analysis. Winsorization allows for the relative preservation of data while reducing the skew caused by outliers on the overall distribution (Field, 2009). Overall, there were five outliers on the Peer Conflict Scale (PSC), one of which was found on the reactive relational aggression scale. All outliers were winsorized. All other data was normally distributed. Multivariate outliers were assessed using Mahalanobis distance. The probability of abnormal score patterns amongst three predictors (social anxiety, trait anger and anger rumination) was calculated using Chi square.

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Scores below the threshold of $\chi^2 < .001$ were considered outliers. All scores were above this threshold, showing no abnormal score patterns. Multicollinearity amongst predictor variables also was assessed. All variables were found to be distributed within a normal range (VIF > .50; Tolerance ranged from 1.0 to 2.2).

Study Analyses

The major hypothesis (Hypothesis 6) predicted that anger rumination is one mechanism through which socially anxious teens engage in greater levels of reactive relational aggression. Importantly, this relationship was only expected to be present in teens with higher levels of trait anger. In order to test this hypothesis, a conditional process analysis was conducted (moderated-mediation; Hayes, 2013).

Prior to computing the conditional process analysis, several preliminary steps were completed. First, Pearson bivariate correlations were conducted to assess relationships among constructs, as described above. All correlations were significantly and positively correlated at a significance level of $p = .01$. Briefly, the social anxiety total score was significantly and positively correlated with trait anger ($r = .62$), anger rumination ($r = .62$), and reactive relational aggression ($r = .32$). Trait anger showed a significant and positive relationship to anger rumination ($r = .68$) and reactive relational aggression ($r = .39$). Similarly, anger rumination and reactive relational aggression were also significantly and positively related ($r = .39$).

Next, five linear regressions were completed to further elucidate the associations among social anxiety, trait anger, anger rumination, and reactive relational aggression (Hypotheses 1-5).

Social Anxiety. Linear regressions were computed separately to examine relationships between social anxiety and reactive relational aggression, and social anxiety and trait anger and anger rumination. A significant relationship was found between social anxiety and reactive relational aggression (Hypothesis 1; path C in *Figure 1*). Results indicated the model explained 10% of the variance in reactive relational aggression [$R^2 = .10$, adjusted $R^2 = .09$, $F(1, 99) = 11.00$, $p = .001$]. Teens with greater levels of social anxiety also showed higher rates of reactive relational aggression ($b = .06$, $p = .001$). A significant relationship between social anxiety and anger rumination was also found (Hypothesis 3; path A in *Figure 1*). Specifically, results indicated the model accounted for 38% of the variance in anger rumination [$R^2 = .38$, adjusted $R^2 = .37$, $F(1, 99) = 61.44$, $p < .001$]. Teens with higher levels of social anxiety showed increased rates of anger rumination ($b = .44$, $p < .001$). Lastly, social anxiety was also significantly related to trait anger (Hypothesis 2). Data showed that the model accounted for 38% of the variance in trait anger [$R^2 = .38$, adjusted $R^2 = .38$, $F(1, 100) = 63.01$, $p < .001$], suggesting that adolescents with social anxiety also showed heightened levels of trait anger ($b = .16$, $p < .001$).

Anger Rumination. To assess the remaining legs of the model, two linear regressions were computed between anger rumination and trait anger (Hypothesis 4) and anger rumination and reactive relational aggression (Hypothesis 5). Consistent with hypotheses, results showed a significant association between anger rumination and trait anger, with the model accounting for 46% variance in trait anger [$R^2 = .46$, adjusted $R^2 = .46$, $F(1, 100) = 87.27$, $p < .001$]. Teens with high levels of anger rumination also exhibited greater levels of trait anger ($b = .24$, $p < .001$). The relationship between anger rumination and reactive relational aggression was consistent with a priori predictions, with the model explaining 15% of the variance in reactive relational aggression [$R^2 = .15$, adjusted $R^2 = .14$, $F(1, 100) = 17.52$, $p < .001$], suggesting that adolescents

with greater anger rumination also engage in increased levels of reactive relational aggression (b = .10, p < .001; path B in *Figure 1*).

Further, a process analysis using bootstrapping estimation (1000 samples; Hayes, 2013) was conducted in order to assess the meditational role of anger rumination within the model. The overall model was significant [R^2 = .16, F(2, 98) = 7.19, p = .001], showing that together, social anxiety and anger rumination accounted for 16% of the variance in reactive relational aggression. Increased social anxiety led to greater levels of anger rumination (b = .44, p < .001) and as anger rumination increased, so did the likelihood that adolescents engaged in reactive relational aggression (b = .09, p = .022). The total effect was significant and positive (b = .06, p = .001). The direct effect was no longer significant once anger rumination was entered into the model (b = .02, BC 95% CI: -.023, .063). The indirect effect was significant, suggesting that when controlling for anger rumination, the relationship between social anxiety and reactive relational aggression was reduced (b = .04, BC 95% CI: .011, .069). Taken together, results indicate that anger rumination is one mechanism through which social anxiety and reactive relational aggression are related.

Finally, to test the major hypothesis (Hypothesis 6), a conditional process analysis was computed using bootstrapping estimation (N = 101; 1000 samples; Hayes 2013). The overall model was significant [R^2 = .17, F(2, 98) = 7.19, p = .001], showing that together, social anxiety and anger rumination accounted for 17% of the variance in reactive relational aggression (see *Figure 2)*. Social anxiety alone did not significantly predict anger rumination (path A; b = -.17, p = .332), but anger rumination was positively and significantly linked to reactive relational aggression (path B; b = .09, p = .022). When anger rumination was introduced into the model, the direct effect was no longer significant (path C'; b = .02, p = .360); however, the index of

moderated mediation was significant (b = .002, BC 95% CI: .0003, .005] suggesting that the mediating effect of anger rumination on the relation between social anxiety and reactive relational aggression is further moderated by trait anger.

The mediating effect of anger rumination was significant at each level, one standard deviation below the mean (i.e., low), at the mean (i.e., average), and one standard deviation above the mean (i.e., high) of trait anger [R^2 = .55, F (3, 97) = 44.08, p < .001; see Table 3]. As shown in Table 3, social anxiety was significantly associated with anger rumination at low, average, and high levels of trait anger, but the association was strongest at high levels of trait anger (b = .03, BC 95% CI: .009, .063).

Table 3

Conditional Effects of Social Anxiety on Anger Rumination at Levels of Trait Anger Predicting Reactive Relational Aggression

Trait Anger	b	SE	95% CI	
Low	.01	.007	.002,	.032
Average	.02	.009	.006,	.043
High	.03	.013	.009,	.063

Figure 2. Conditional Process Analysis: Social Anxiety and Reactive Relational Aggression

Index of Moderated Mediation
(b = .002, BC 95% CI: .0003, .005)
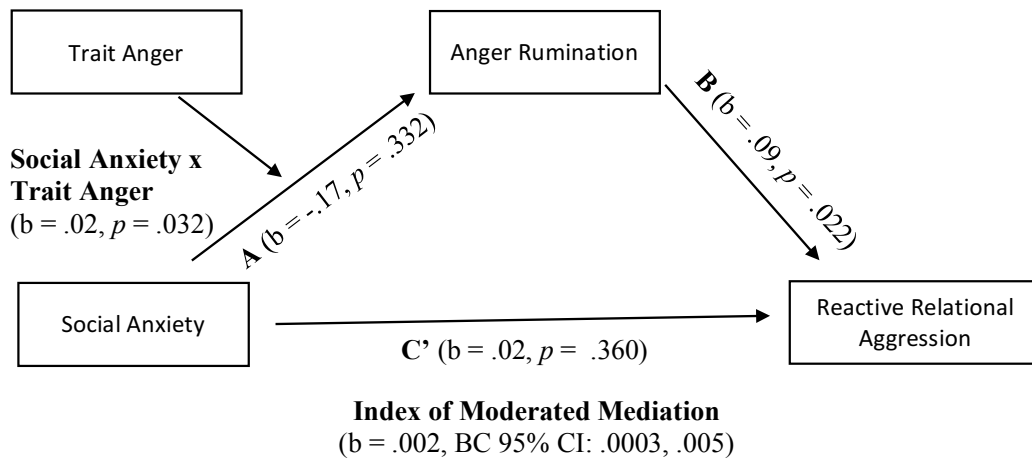
Alternative Models

Trait Anger

Overall, studies suggest anger might play a role in the association between social anxiety and reactive relational aggression, however, it is unclear given limited research how anger impacts this relationship. As such, an alternative model was explored to further to assess the role of trait anger in teens with social anxiety. Trait anger was also assessed as a moderator of the association between anger rumination and reactive relational aggression (B path). Data failed to support this model, showing that the interaction between anger rumination and trait anger was not significant (b = -.00, p = .592, see *Figure* 3).

Figure 3. Conditional Process Analysis: Trait Anger as a Moderator
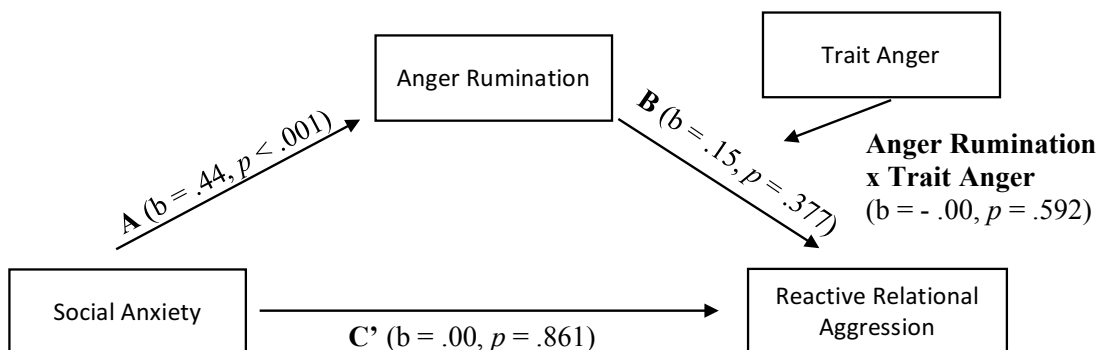
Gender

Although there are a clear gender differences in rates of social anxiety, evidence is mixed for adolescents who engage in reactive relational aggression, anger rumination and trait anger. Consequently, a conditional process analysis assessed whether the mediating effect of anger rumination on the relation between social anxiety and reactive relational aggression is further moderated by trait anger and whether each leg of the model is further moderated by gender. Data was not supportive, indicating that gender does not further moderate this model (see *Figure* 4).

Figure 4. Conditional Process Analysis: Gender and Trait Anger as a Moderator
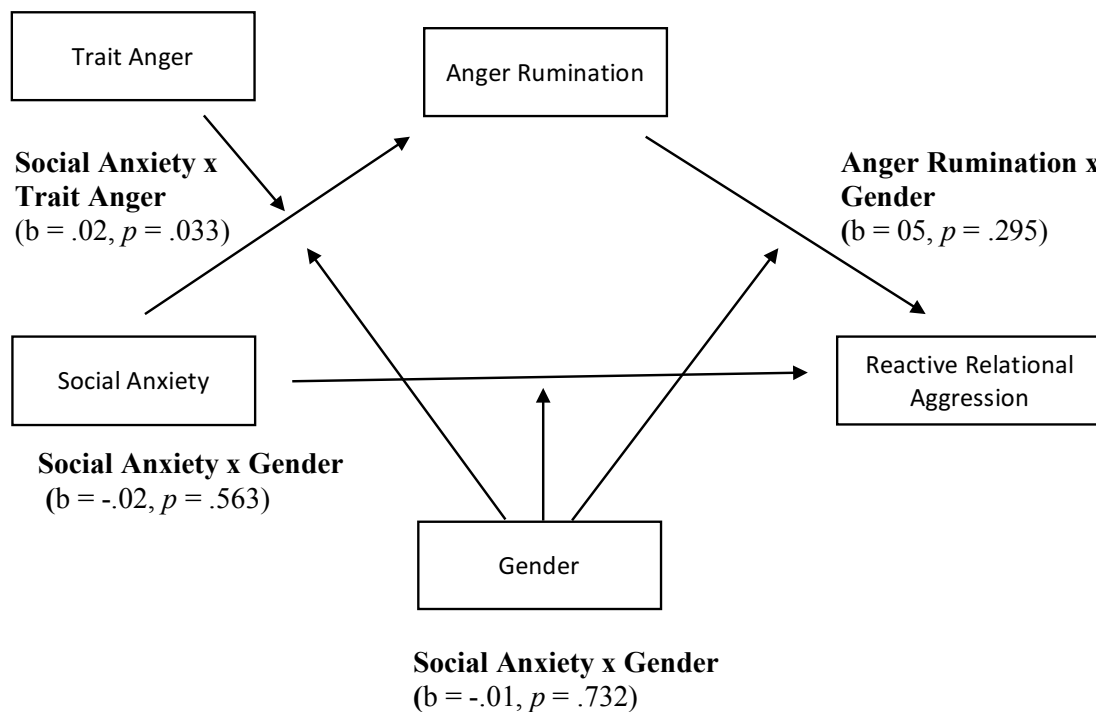
Note: Figure denotes whether social anxiety is associated with reactive relational aggression through use of anger rumination and whether this relationship is further moderated by trait anger and gender. The relationship between social anxiety and anger rumination was not moderated by gender (b = -.02, *p* =.563). The relationships between social anxiety and reactive relational aggression was not further moderated by gender (b = -.01, *p* = .732), nor was the relationship between anger rumination and reactive relational aggression (b = .05, *p* = .295).

Depression

Research indicates social anxiety and depression are highly related. In the current study, social anxiety and depression were significantly and positively correlated, $r = .67$, $p < .01$. Given this knowledge, an analysis was completed to assess whether the major hypothesized model could also be explained by depression. As such, a conditional process analysis also explored whether anger rumination was one mechanism through which depressed teens engaged in greater levels of reactive relational aggression, particularly in teens with higher levels of trait anger. Several preliminary steps were taken before computing the conditional process analysis. Multivariate outliers and multicollinearity were assessed using the same preliminary data analysis techniques described above. No violations of multicollinearity or problems with outliers were found. Pearson bivariate correlations were computed to examine the relationships among targeted constructs (see Table 1). Next, three separate simple regressions were computed to assess the relationship among depression, trait anger, anger rumination and reactive relational aggression. Depression and reactive relational aggression were significantly related. Data showed depression accounted for 8% of the variance in reactive relational aggression [$R^2 = .08$, adjusted $R^2 = .07$, $F(1, 100) = 83.30$, $p = .004$]. Teens with greater levels of depression also showed higher rates of reactive relational aggression ($b = .089$, $p = .004$). A similar positive and significant relationship was seen between depression and trait anger. Results indicated the model was significant finding that depression comprised 33% of the variance in trait anger [$R^2 = .33$, adjusted $R^2 = .32$, $F(1, 101) = 49.52$, $p < .001$], showing that adolescents with greater levels of depression also experience more trait anger ($b = .25$, $p < .001$). Lastly, the association between depression and anger rumination was examined. Results showed the model was significant, wherein depression accounted for 51% of the variance in anger rumination [$R^2 = .51$, adjusted R^2

= .50, $F(1, 99) = 102.99$, $p < .001$], suggesting that teens with depression had higher levels of anger rumination ($b = .89$, $p < .001$).

Furthermore, a process analysis using bootstrapping estimation (1000 samples; Hayes, 2013) was computed to examine the meditational role of anger rumination within the depression model. The model was significant [$R^2 = .14$, $F(2, 98) = 8.30$, $p = .001$], showing that together, depression and anger rumination comprised 14% of the variance in reactive relational aggression. Greater levels of depression led to increased anger rumination ($b = .90$, $p < .001$) and greater anger rumination led adolescents to engage in more reactive relational aggression ($b = .09$, $p = .009$). The direct effect was no longer significant once anger rumination was entered into the model ($b = .01$, BC 95% CI: -.069, .095). The indirect effect was significant, suggesting that when controlling for anger rumination, the relationship between depression and reactive relational aggression was reduced ($b = .07$, BC 95% CI: .024, .139). Results indicate that anger rumination is one mechanism through which depression and reactive relational aggression are also related.

Finally, to test the overall depression model, a conditional process analysis was computed using bootstrapping estimation (N = 101; 1000 samples; Hayes 2013). A simple regression test was completed to examine the direct effect of depression on reactive relational aggression, without the moderator or mediator present. Results indicated teens with greater levels of depression also showed higher rates of reactive relational aggression (path C; $b = .08$, $p = .004$). Turning to the conditional process analysis (see *Figure 5)* the overall model was significant [$R^2 = .14$, $F(2, 98) = 5.73$, $p = .004$]. Depression and anger rumination comprised 14% of the variance in reactive relational aggression. Depression alone did not significantly predict anger rumination (path A; $b = - .28$, $p = .459$), but anger rumination was positively and significantly linked to

reactive relational aggression (path B; $b = .09$, $p = .018$). When anger rumination was introduced into the model, the direct effect was no longer significant (path C'; $b = .01$, $p = .760$); however, the index of moderated mediation was significant ($b = .004$, BC 95% CI: .0002, .009] suggesting that the mediating effect of anger rumination on the relationship between depression and reactive relational aggression is further moderated by trait anger.

The mediating effect of anger rumination was also significant at each level, one standard deviation below the mean (i.e., low), at the mean (i.e., average), and one standard deviation above the mean (i.e., high) of trait anger [$R^2 = .64$, $F(3, 97) = 60.25$, $p < .001$]. As shown in Table 4, depression was significantly associated with anger rumination at low, average, and high levels of trait anger, but the association was strongest at high levels of trait anger ($b = .06$, BC 95% CI: .022, .121). Findings suggest that reactive relational aggression may not be specific to social anxiety and extend to other internalizing disorders.

Table 4

Conditional Effects of Depression on Anger Rumination at Levels of Trait Anger Predicting Reactive Relational Aggression

Trait Anger	*b*	*SE*	95% CI	
Low	.03	.017	.005,	.071
Average	.04	.019	.016,	.091
High	.06	.026	.022,	.121

Figure 5. Conditional Process Analysis: Depression and Reactive Relational Aggression

Index of Moderated Mediation
(b = .004, BC 95% CI: .0002, .009)
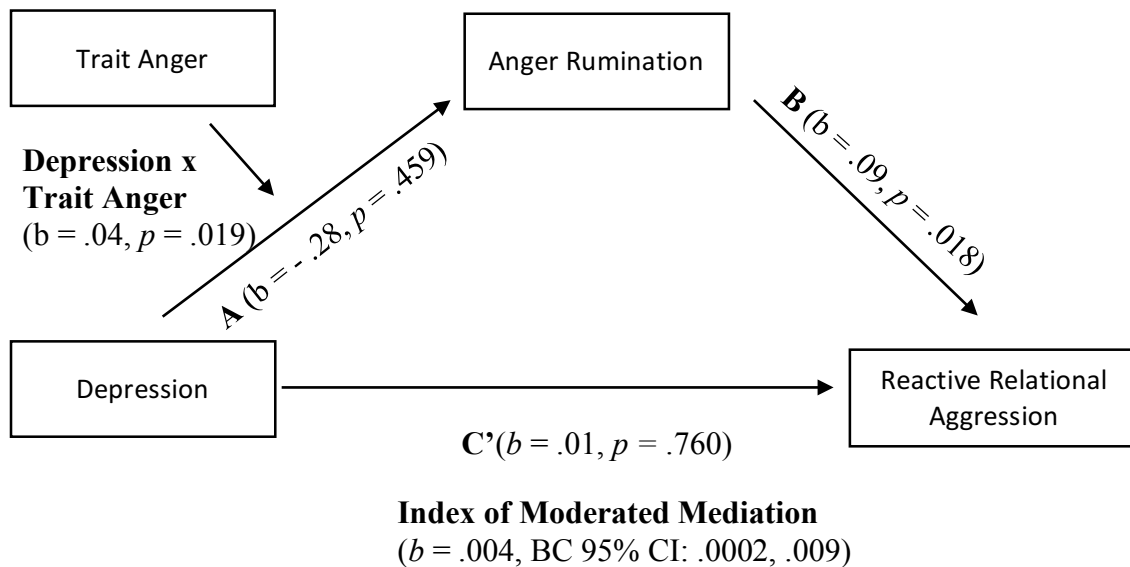
Reactive Physical Aggression

Literature also indicates relational and physical aggression are moderately correlated and often co-occurring. In the current study, reactive relational and reactive physical aggression were significantly and positively correlated, r = .46, p < .01. As such, a conditional process analysis also assessed whether anger rumination indirectly linked social anxiety to reactive physical aggression, but only in adolescents with high levels of trait anger. Multivariate outliers and multicollinearity were assessed using the same preliminary data analysis techniques described previously. No violations of multicollinearity or problems with multivariate outliers were found. Pearson bivariate correlations were computed to assess relationships among constructs finding that social anxiety was significantly and positively related to reactive physical aggression (r =.42, p < .001). Trait anger (r =.50, p < .001) and anger rumination (r =.46, p < .001) were also positively and significantly related to reactive physical aggression. Next, two separate simple regressions were computed to assess the relationship between social anxiety and reactive physical aggression and anger rumination and reactive physical aggression. Social anxiety and

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reactive physical aggression were significantly related, comprising 17% of the variance in reactive physical aggression [R^2 = .17, adjusted R^2 = .17, $F(1, 99)$ = 21.29, $p < .001$]. Data showed that adolescents with greater levels of social anxiety also showed higher rates of reactive physical aggression (b = .07, $p < .001$). A similar association was seen between anger rumination and reactive physical aggression. Anger rumination accounted for 21% of the variance in reactive physical aggression [R^2 = .21, adjusted R^2 = .21, F (1, 100) = 27.21, $p < .001$]. Results indicated that teens with heightened anger rumination engaged in greater levels of reactive physical aggression (b = .12, $p < .001$).

Furthermore, a process analysis using bootstrapping estimation (1000 samples; Hayes, 2013) was computed to examine the meditational role of anger rumination in the link between social anxiety and reactive physical aggression. The model was significant [R^2 = .22, $F(2, 98)$ = 13.54 $p < .001$], showing that together, social anxiety and anger rumination accounted for 22% of the variance in reactive physical aggression. Social anxiety led to greater anger rumination (b = .44, $p < .001$) and anger rumination led to marginally greater levels of reactive physical aggression (b = .07, $p = .053$). The direct effect was still significant once anger rumination was entered into the model (b = .05, BC 95% CI: .003, .090). The indirect effect was significant, suggesting that when controlling for anger rumination, the relationship between social anxiety and reactive physical aggression was reduced (b = .03, BC 95% CI: .004, .060). Results indicate that anger rumination partially mediated the link between social anxiety and reactive physical aggression.

Finally, to test the overall model using reactive physical aggression, a conditional process analysis was computed using bootstrapping estimation (N = 101; 1000 samples; Hayes 2013). A simple regression test was completed to examine the direct effect of social anxiety on reactive

physical aggression, without the moderator or mediator present, as described above. Results

indicated teens with greater levels of social anxiety also engaged in more reactive physical

aggression (b = .07, p < .001). Turning to the conditional process analysis (see *Figure 6)* the

overall model was significant [R^2 = .22, $F(2, 98)$ = 13.54, p < .001]. Social anxiety and anger

rumination comprised 22% of the variance in reactive physical aggression. Similar to the

hypothesized model with reactive relational aggression, social anxiety alone did not significantly

predict anger rumination (path A; b = - .17, p = .332), but anger rumination was marginally

linked to reactive physical aggression (path B; b = .07, p = .053). When anger rumination was

introduced into the model, the direct effect remained significant (path C'; b = .04, p = .038). The

index of moderated mediation was not significant (b = .001, BC 95% CI: .000, .004] suggesting

that anger rumination partially mediated the association between social anxiety and reactive

physical aggression; however, the relationship between social anxiety and anger rumination was

not further moderated by trait anger.

Figure 6. Conditional Process Analysis: Social Anxiety and Reactive Physical Aggression

Index of Moderated Mediation
(b = .001, BC 95% CI: .000, .004)

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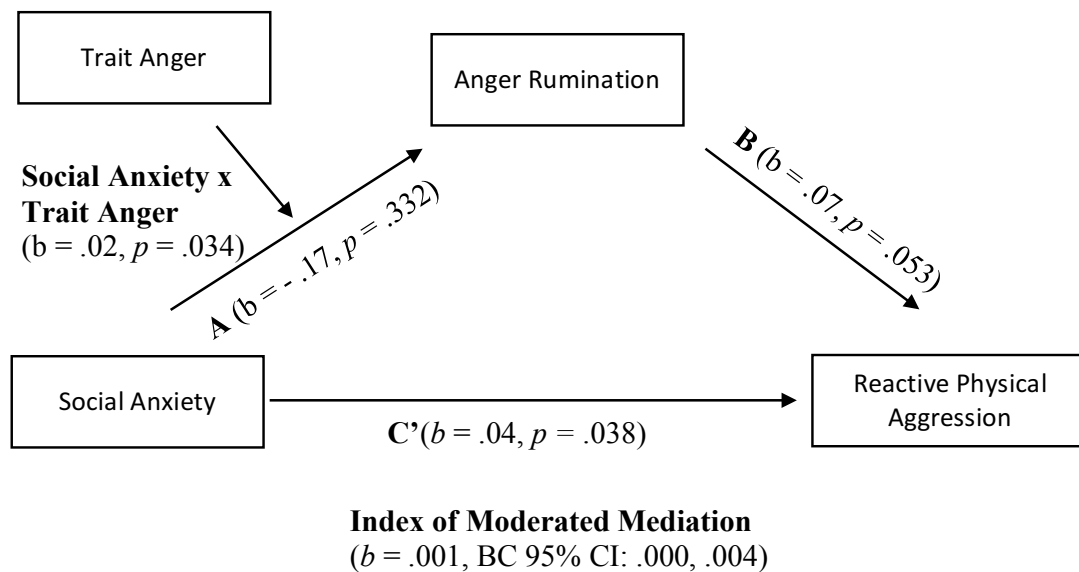
CHAPTER VI

DISCUSSION

Summary of Findings

Prior research has suggested that social anxiety is linked to aggressive behavior, particularly reactive and relational aggression (e.g., Batanova & Loukas, 2011; Loukas et al., 2005). Studies to date, however, have been limited in important ways. These limitations include the failure to target the social anxiety and aggression link with middle adolescent participants, examine underlying factors that may explain the relationship between social anxiety and reactive relational aggression, and combine the form (e.g., relational) and function (e.g., reactive) of aggression to better understand its link to social anxiety. Consequently, the goal of the present study was two-fold: (1) to assess the relationship between social anxiety and reactive relational aggression in high school aged adolescents, combining the form and function of aggression; and (2) to examine trait anger and anger rumination as underlying factors that may explain the relationship between social anxiety and reactive relational aggression.

In the present study, social anxiety was hypothesized to be related to reactive relational aggression through the use of anger rumination, but only amongst adolescents with higher levels of trait anger. Findings supported this hypothesis. Teens with higher levels of social anxiety were more likely to enact reactive relational aggression when they engaged in anger rumination as a coping strategy. This relationship was strongest in teens with higher levels of trait anger. Gender differences amongst constructs were also explored. Although the overall model did not differ as a function of gender, mean-level differences were found. Female adolescents showed greater levels of social anxiety and anger rumination than male adolescents. No gender differences were found among adolescents with trait anger or reactive relational aggression.

The implications of these findings are discussed below with an eye toward integrating them with prior work in this area. This is followed by coverage of alternative models (depression, reactive physical aggression), study limitations, and conclusions and future directions.

Implications of Study Findings

Social Anxiety and Reactive Relational Aggression

Social anxiety has been linked to relational aggression in early adolescent (age 10-14; Batanova & Loukas, 2011; Loukas et al., 2005) and college-age samples (Gros et al., 2010; Loudin et al., 2003; Storch et al., 2004). Similarly, social anxiety has also been associated with reactive aggression in children and adolescents (Raine et al., 2006; Xu & Zhang, 2008), as well as college-aged samples (Howell et al., 2014). Although the literature has shown links between social anxiety and relational aggression, as well as between social anxiety and reactive aggression, research has failed to examine both the form and function of aggression and their relationships to social anxiety. The present study built upon this prior research by examining social anxiety and its link to reactive relational aggression, including both form and function, filling a gap in the literature. Results indicated a significant and positive relationship between social anxiety and reactive relational aggression, suggesting teens with social anxiety were more likely to enact reactive relational aggression (*Figure 2*, path C). Findings also indicated that teens with social anxiety were more likely to engage in reactive relational aggression if they ruminated about situations that created anger (i.e., anger rumination), highlighting the tendency for socially anxious teens to engage in maladaptive cognitive coping styles. Additionally, this relationship was only present in adolescents who also showed higher levels of trait anger. The

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relationship among social anxiety, reactive relational aggression, and rumination will be discussed further within the rumination section below.

These results are consistent with literature characterizing a subgroup of those with social anxiety. More specifically, research has suggested that some individuals with social anxiety are characterized as more angry and hostile, rather than submissive/inhibited (Hofmann, Heinrichs, & Moscovitch, 2004). These individuals also tend to have greater difficulty being assertive in social situations. It is possible that due to this lack of assertiveness and greater levels of anger, socially anxious adolescents use reactive relational aggression as a way to express their anger towards others. Moreover, literature also suggests that feelings of shame may help explain the association among social anxiety, aggressive behavior and anger. Inherent in those with social anxiety is fearing humiliation/embarrassment or doing something wrong (Essau, Conradt, & Petermann, 1999), which could lead to feelings of shame. Literature has suggested that shame is connected to greater expression of anger and hostility (Hofmann et al., 2004) and given difficulties with assertiveness, the safest way to express negative emotions (i.e., shame, anger) for teens with social anxiety, could be engaging in covert forms of aggression, like reactive relational aggression.

Gender differences were also explored in the current study, with mean-level gender differences found among teens with social anxiety and anger rumination. Consistent with prior research and study hypotheses, mean-level differences in social anxiety were found, with higher rates amongst female rather than male adolescents. Female adolescents also showed higher levels of anger rumination than males. Gender findings pertaining to anger rumination will be discussed within the rumination section below. Although clear gender differences were found among teens with social anxiety, research is mixed when examining gender differences among adolescents

who engage in reactive relational aggression. Some literature suggests that females engage in higher rates of relational aggression (Bjorkqvist, et al., 1992; Heilbron & Prinstein, 2008), whereas other studies have found no significant gender differences (Card et al., 2008; Green et al., 1996; Marshall et al., 2015). The current study supports the latter findings. No significant gender differences were found for reactive relational aggression, suggesting that males and females engage in reactive relational aggression at similar rates.

The literature contains proposals attempting to account for the lack of gender differences, including greater social status/social acceptance, mixed-gender friendships, and goal attainment. As children approach adolescence, physical aggression is seen as a less acceptable method of expressing anger/frustration (Rys & Bear, 1997; Werner & Hill, 2010). Conversely, relational aggression is met with greater approval (Werner & Hill, 2010) and social acceptance (Salmivalli, Kaukiainen & Lagerspetz, 2000). Relational aggression is used to express frustration/anger with peers and to attain social goals (i.e., enhance social status in peer group; Werner & Grant, 2008). Females are also less likely than males to see physical aggression as acceptable behavior (Rys & Bear, 1997). For adolescents, friendships and peer groups are also expanding to include both males and females (La Greca & Harrison, 2005). Given these mixed-gender friendships, males, in particular, may be learning that relationally aggressive methods are effective ways to express negative emotions and to reach their social goals. In fact, in one study, adolescent males and females who engaged in relational aggression had greater social status (Rose et al., 2004). Given that adolescents of both genders appear to see relational aggression as a more normative way of inflicting harm, this might explain why many studies have found no gender differences among adolescent populations (Card et al., 2008; Green et al., 1996; Marshall et al., 2015; Sullivan et al., 2010).

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Rumination

Maladaptive cognitive and emotion regulation strategies are seen in social anxiety and reactive relational aggression. Youth with social anxiety experience negative emotions, including anger, with greater intensity (Suveg & Zeman, 2004) and tend to indirectly express that anger (e.g., slamming doors, whining; Zeman et al., 2002). Socially anxious adolescents also use rumination as a coping strategy to manage negative affect (Jose, Wilkins, & Spendelow, 2012) and the use of rumination is especially common amongst female adolescents (Jose & Brown, 2008). Furthermore, rumination, focused on situations that create anger is associated with social anxiety in college-aged samples (Trew & Alden, 2009; Weber et al., 2004). Despite these apparent connections, no studies prior to the current investigation have examined anger rumination, trait anger, and their links to social anxiety in adolescents.

The present findings added to the literature by showing that socially anxious adolescents engaged in greater rumination (*Figure 2,* path A) and that the association between social anxiety and trait anger was positively and significantly related (see Table 1). Socially anxious adolescents were more likely to ruminate about experiences that create anger and have higher levels of trait anger, which expands our understanding of how adolescents with social anxiety manage and experience negative affect, particularly anger. Similarly, investigations of anger rumination and trait anger have shown links to reactive and relational aggression (Peled & Moretti, 2007; 2010; White & Turner, 2014). However, studies have yet to combine the form (i.e., relational) and function (i.e., reactive) of aggression to examine its link to anger rumination and trait anger. Consequently, the present study assessed the association among anger rumination, trait anger and reactive relational aggression in adolescents. Anger rumination was significantly related to reactive relational aggression (*Figure 2*, path B), coinciding with prior

research. In addition, trait anger was positively and significantly correlated to reactive relational aggression.

Prior research supports these findings. In a clinical sample of adolescents and community sample of young adults, anger rumination and trait anger were independent and positive predictors of relational aggression (Peled & Moretti, 2007; 2010) and anger rumination was also linked to reactive aggression in an undergraduate sample (White & Turner, 2014). Results from past studies and the present investigation indicate the importance of understanding both the cognitive and affective components that precipitate the use of aggressive behavior (Peled & Moretti, 2007). In fact, outcomes of the current study may indicate that socially anxious teens who engage in ruminative coping strategies deplete their self-regulatory resources to manage negative emotions (Kashdan et al., 2008; Kashdan & Hofmann, 2008; Muraven & Baumeister, 2000), resulting in greater use of reactive relational aggression. This hypothesis would be consistent with Muravan and Baumeister's (2000) theory, which purports that self-regulation/self-control is a limited resource. Attempting to actively control attention, or manage affect uses significant cognitive resources. This limits the use of cognitive resources for subsequent situations that require self-control (Muravan & Baumeister, 2000). An overtaxed self-regulatory system may make it more likely that adolescents engage in ruminative and aggressive behavior (Muravan et al., 1998), as socially anxious adolescents may be unable to inhibit or manage negative thoughts and emotions.

Rumination about negative events or negative affect may also place adolescents, particularly females, at higher risk for internalizing problems (Abela & Hankin, 2011). In fact, in past studies, rumination was found to be a risk factor for anxiety and depression in adolescents (McLaughlin & Nolen-Hoeksema, 2012) and higher rates of rumination are found among female

adolescents (Jose & Brown, 2008). The current study also found that female adolescents showed higher rates of anger rumination than males, which coincides with prior research (e.g., Peled & Moretti, 2007). Theories have speculated on why rumination may predispose females rather than males to internalizing disorders. The response styles theory was initially proposed to explain gender differences in depression among adolescents (Nolen-Hoeksema, 1994), but has since been expanded to include anxiety, more generally (Roelofs, Rood, Meesters, te Dorsthorst, Bogels, Alloy & Nolen-Hoeksema, 2009) and social anxiety (Jose et al., 2012).

Although the present study examined a specific type of rumination, anger rumination, instead of general rumination, discussion of response style theory may provide insight into why gender differences among teens with anger rumination were found. The response style theory purports that females engage in more emotion-focused coping (i.e., rumination) and less active problem-solving, which places them at higher risk for the development of internalizing problems than males. Ruminative response styles of coping also appear to interfere with problem-solving abilities in complex interpersonal situations (Nolen-Hoeksema, 1994) inherent in both depression and social anxiety. Research has supported the response style theory in youth with both anxiety and depression. For instance, in a longitudinal study examining response style theory in youth (10-17 years), Roelofs and colleagues assessed depression, trait anxiety, rumination and distraction over 10 weeks (Roelofs et al., 2009). Youth who had a tendency to use rumination, instead of distraction, as a coping strategy showed greater levels of trait anxiety and depression over time. Females showed higher rates of rumination. Similarly, socially anxious youth show greater levels of rumination after anxiety-provoking social events (Kocovski & Rector, 2007) and female adolescents have a greater tendency to use rumination as a coping strategy to manage negative affect when anxious (Jose et al., 2012). Given this literature, it is not surprising that the

current study also found gender differences in anger rumination, with higher rates of anger rumination in females and a tendency for socially anxious teens to engage in greater levels of anger rumination.

Alternative Models

Depression. Depression is often comorbid with anxiety disorders, including social anxiety disorder (Beesdo et al., 2007; Essau et al., 1999), with the onset of depression and social anxiety found to peak in the teenage years (Jose & Brown, 2008; Wittchen et al., 1999). Given this comorbid relationship, the current study examined whether depression might also explain the relationship among anger rumination, trait anger, and reactive relational aggression. In particular, the present study assessed whether depressed teens engaged in greater levels of reactive relational aggression due to the use of anger rumination and whether this relationship was further explained by higher levels of trait anger. Support for this alternative model was found. Specifically, depressed teens were more likely to engage in reactive relational aggression if they also reported anger rumination and this relationship was strongest at higher levels of trait anger. Findings suggest that the use of reactive relational aggression may not be specific to social anxiety and extend to other internalizing disorders.

Prior research points to underlying emotional and cognitive factors (Abela & Hankin, 2011; Klemanski et al., 2017) that may explain why both social anxiety and depression may be linked to trait anger, anger rumination and reactive relational aggression. Anger and rumination may be two factors that link depression and social anxiety to reactive relational aggression. Increased irritability and greater frustration are major tenets of depression in adolescents (American Psychological Association, 2013) and adolescents report experiencing a mixture of sad and angry affect when depressed (Renouf & Harter, 1990). Research posits that adolescents

who experience intense and fluctuating levels of anger and anxiety are also more likely to have depressive symptoms (Silk, Steinberg & Morris, 2003) and their anger is often directed towards others (Renouf & Harter, 1990). The current study added to prior research by showing that teens with greater levels of depression experience higher levels of trait anger and are more likely to engage in reactive relational aggression. Findings confirm that reactive relational aggression is in fact more widely connected to internalizing symptoms.

Rumination as a coping strategy to manage negative affect has also been clearly linked to depression in adolescents (Abela & Hankin, 2011; Muris, Fokke, & Kwik, 2009). When using rumination to manage anger or sadness, adolescents also tend to maintain greater levels of negative emotion (Silk et al., 2003), which may contribute to the use of more covert strategies, like reactive relational aggression to manage negative affect. Although not specific to a form/function of aggression, research does support a link among general aggressive behavior, rumination and internalizing symptoms. For instance, McGlaughlin and colleagues (2014) examined rumination, general aggressive behavior, and general anxiety and depression in early adolescents (6th-8th grade) over a 7-month period. The authors found a bidirectional relationship between general aggressive behavior and anxiety and depression in early adolescents. Rumination was a significant factor that explained the relationship between depression and later aggressive behavior (McGlaughlin, Aldao, Wisco, & Hilt, 2014). Although this investigation provides some insight into depression and its link to aggressive behavior, it did not assess more particular types of aggressive behavior (to include the form and function of aggression).

Overall, only two studies have assessed sadness/depression and relationally aggressive behavior, one of which used a college sample. For example, Storch and colleagues examined aggressive behavior and psychopathology in a cross-sectional, undergraduate sample, finding

that relational aggression was linked to both social anxiety and depressive symptoms in college females only (Storch et al., 2004). Although this provides some evidence in young adult samples, we know less about adolescents. The second study provides some insight into the regulation of sadness and its link to relational aggression in younger adolescents. Sullivan and colleagues (2009) examined how negative affect regulation (sadness, anger) was linked to relational aggression in youth (5th-8th graders). Youth who were less able to regulate sad affect and more reluctant to express emotion were more likely to engage in relational aggression (Sullivan et al., 2009). The current study adds to prior research by bolstering our understanding of the role of anger in adolescents who experience depression. Specifically, like socially anxious adolescents, teens with greater levels of depression showed more difficulty managing negative emotions, like anger, and cognitive coping deficits, such as anger rumination. Underlying cognitive and emotional factors, such as anger and rumination, are key to understanding why adolescents with social anxiety and depression engage in aggressive behavior.

Reactive Physical Aggression. Reactive relational and physical aggression also tend to frequently co-occur and studies indicate relational and physical aggression are positively and moderately correlated (Little et al., 2003; Prinstein et al., 2001). As such, the current study assessed whether the relationship between social anxiety was specific to one form of aggression. In particular, analyses examined whether social anxiety was linked to reactive physical aggression through anger rumination and if this association was further moderated by trait anger. Findings indicated that teens with greater levels of social anxiety also engaged in more reactive physical aggression (*Figure* 6, path C). Further, anger rumination partially mediated the association between social anxiety and reactive physical aggression; however, the relationship

between social anxiety and reactive physical aggression was not further moderated by trait anger. In comparison to reactive relational aggression, this alternative model showed a poorer fit.

Though there appears to be a stronger relationship between social anxiety and reactive relational aggression, a review of prior literature that may elucidate the relationship between social anxiety and reactive physical aggression is warranted. Overall, studies show tenuous findings, at best, between social anxiety and physical aggression, with the majority of research focused on college samples (Hanby et al., 2012; Storch et al., 2004). Only two studies have examined social anxiety and physical aggression in early adolescents (age 10-14 years), both finding no direct relationship between the constructs (e.g., Batanova & Loukas, 2011; Loukas et al., 2005). For instance, a cross-sectional study of early adolescents assessed parenting behavior, social anxiety, and aggressive behavior. Social anxiety was found to negatively predict the use of physical aggression. Males who reported higher levels of social anxiety also reported using lower levels of physical aggression, suggesting social anxiety buffers teens' engagement in physical aggression (Loukas et al., 2005). Further, a longitudinal study examined social anxiety, aggression and cognitive and emotional factors (i.e., perspective taking, empathy) in younger adolescents. Results indicated social anxiety was linked to greater levels of relational aggression when empathic concern was low in youth, but no linkage to physical aggression was found (Batanova & Loukas, 2011). These data suggest either no relationship or a weak association between social anxiety and physical aggression. which is at odds with results of the present study, in which a moderate correlation between reactive physical aggression and social anxiety was found. Additionally, social anxiety uniquely and significantly predicted reactive physical aggression.

Differences in measurement might explain why the current findings contrast with prior literature. In particular, previous investigations only assessed the form (i.e., physical aggression), but not the function (i.e., reactive) of aggression. It is possible that combining form and function would have provided a more accurate picture of aggressive behavior in adolescents. Furthermore, prior literature assessed physical aggression using Crick's (1996) 3-item scale. This scale assessed whether adolescents had hit others/initiated physical fights and called peers names (Batanova & Loukas, 2011; Loukas et al., 2005). The limited nature of the scale may not have adequately captured physically aggressive behaviors in young adolescents. In contrast, the Peer Conflict Scale (PCS; Marsee & Frick, 2007), which was used in the present study, is a 10-item scale that assessed physically aggressive behavior, as well as the underlying function of the behavior (e.g., "When someone hurts me, I end up getting into a fight," "I threaten others when they do something wrong to me"). The specific nature of the questions on the PCS may have provided a clearer picture of physically aggressive behaviors in adolescents. There is a clear need for additional research to better understand the relationship between social anxiety and physically aggressive behavior in teens and to replicate current study findings. Assessment of specific aggressive behaviors (e.g., verbal vs. physical aggression) that may precipitate the link between physical aggression and social anxiety may prove helpful to better understand this relationship.

Limitations

Although the current study had many strengths, it also had its limitations. First, the study was cross-sectional. Cross-sectional studies only provide information on one specific time point. As a result, causal and temporal associations cannot be made amongst measured variables (Hayes, 2013). It is therefore unclear whether social anxiety precipitates reactive relational

aggression or vice versa. Furthermore, it is often assumed that when mediation models are applied to cross-sectional data the effects are stable reflections of interindividual differences. This assumption often over or underestimates model findings, as the magnitude of effects changes over time. Due to the limitations of applying causal models to cross-sectional data, longitudinal research is recommended to account for inter and intraindividual differences over time (Selig & Preacher, 2009).

Longitudinal research provides some insight into relationships between social anxiety and relational aggression and social anxiety and general rumination. Longitudinal research with younger adolescents suggests that social anxiety may lead to greater levels of relational aggression (Batanova & Loukas, 2011). Less is known about anger rumination and its relationship to social anxiety and reactive relational aggression over time. Longitudinal studies do find, however, that general rumination increases in adolescence, particularly among females (Jose et al., 2012; McLaughlin & Nolen-Hoeksema, 2012) and social anxiety predicts increased rumination (Jose et al., 2012). It is unclear whether similar findings would be seen for anger rumination. Consequently, future research should focus on assessment of anger rumination and its relationship to social anxiety, reactive relational aggression and trait anger to examine how these relationships may develop over middle adolescence.

Second, the current study utilized self-report measures to assess social anxiety, trait anger, anger rumination, and reactive relational aggression in teens. The use of self-report methods may increase the possibility of response bias (e.g., overreporting, random responding, underreporting; Fernandez-Ballesteros, 2004). That said, adolescents may also be the most knowledgeable informants of social anxiety symptoms (Batanova & Loukas, 2011; Marshall et al., 2015). In fact, research has shown low correspondence levels among adolescents and other

informants (e.g., peers, parents, teachers, mental health counselor), particularly when reporting on internalizing symptoms (Achenbach, 1987). Past research shows only modest parent-child agreement of social anxiety symptoms in adolescent samples (La Greca, 2001). This lack of overlap among adolescents and other informants, particularly when assessing internalizing problems, has significant implications. Low correlations among different types of informants indicates the unique contribution of each type of informant in understanding adolescents' internalizing symptoms. For instance, adolescent or parent-reports may better predict specific outcomes for teens with internalizing disorders. Therefore, it is suggested that multiple informants are needed to more fully understand an adolescent's mood and behavior (Achenbach, 1987).

It has also been argued that use of only self-report measures may lead to shared method variance inflating associations amongst constructs (Marshall et al., 2015). Method biases are more likely to be present in studies wherein predictor and outcome variables are assessed using one reporter and one measurement method, which is common in behavioral research (Podaskoff, MacKenzie, Lee & Poasakoff, 2003). One way to limit method bias is by controlling for the shared effects of measured latent variables (Podaskoff et al., 2003). This strategy was used in the current study by assessing constructs with known comorbidities in separate models (e.g., social anxiety and depression, reactive relational and reactive physical aggression). However, correlations among anger rumination, trait anger and social anxiety were higher than expected, overall, potentially inflating model findings. Given the limited literature on social anxiety and its relation to trait anger and anger rumination, it was impossible to predict and account for all potential comorbidities that may contribute to shared variance. Future research should focus on using multiple methods (clinical interview, self-report, experimental designs) and multiple

informants to decrease potential shared variance and further assess relationships among constructs.

Third, the current study was limited by certain sample characteristics (e.g., non-clinical sample, lack of ethnic diversity, low sample size). In particular, the present study focused on school/community participants. As such, patterns amongst the constructs may be different from clinical samples of socially anxious adolescents. Literature assessing social anxiety and aggressive behavior suggests that socially anxious adults in both clinical and community samples show aggressive/risky behaviors (Kashdan & McKnight, 2010). However, it is unclear whether this pattern would be present in an adolescent sample. Moreover, anger rumination is related to relational aggression in both a community sample of young adults and a clinical sample of adolescents (Peled & Moretti, 2007; 2010), suggesting similar findings between both clinical and community samples. However, further research is needed to assess whether patterns between anger rumination and social anxiety in community samples differ from clinical samples of social anxious adolescents.

The study sample was also limited by a lack of ethnic diversity, as the majority of the sample was White (84.6%). Previous investigations using more diverse samples have shown that African American, Latino, and Asian adolescents also engage in reactive and relational aggression (French, Jansen & Pidada, 2002; Loukas et al., 2005; Marsee et al., 2008; Marsee & Frick, 2007); however, studies have failed to show differences in levels of engagement in reactive or relational aggression by race (Loukas et al., 2005; Prinstein et al., 2001). Anger rumination has also been assessed using undergraduate samples in Britain and Hong Kong (Maxwell et al., 2005). Findings suggest that Chinese participants reported greater levels of anger rumination than White participants. However, it is unclear whether similar findings would

be seen in the United States among middle adolescents. Future research is needed to further

investigate whether there are racial/ethnic differences in levels of social anxiety, trait anger,

anger rumination and reactive relational aggression among middle adolescents.

Additionally, a lower sample size (N = 105) may have impacted the power to find

significant gender differences within the moderated-mediation model. A post-hoc power analysis

was completed to test this theory (Gpower: Faul, Lang, & Buchner, 2007). The post-hoc power

analysis indicated that a usable sample size of 100, five predictors, and an alpha of .05, would

result in power of .94, which is consistent with a prior power analysis. Findings suggest the study

had adequate power to test the gender model, which showed non-significant findings. However,

gender was also unevenly distributed within the current sample, with almost twice as many

females than males, which may have also impacted gender findings. It is unclear whether

recruitment of more males in the current study would have resulted in different gender findings.

Research focused on understanding gender influences amongst socially anxious teens with

higher levels of trait anger and anger rumination is warranted.

Conclusions and Future Directions

The present study was conducted to provide a deeper understanding of social anxiety and

aggressive behavior in high school-aged adolescents, as well as to identify underlying emotional

and cognitive factors that may impact this relationship. The study made several novel

contributions to the literature, including assessing the association between social anxiety and

aggression in middle adolescents, combining the form and function of aggression (i.e., reactive

relational aggression) to better understand its link to social anxiety, and examining trait anger

and anger rumination as underlying factors that may explain the relationship between social

anxiety and reactive relational aggression. Results showed a significant and positive association

between social anxiety and reactive relational aggression. Additionally, trait anger and anger rumination were two factors that led socially anxious teens to engage in reactive relational aggression. Alternative models also suggested a similar relationship between depression and reactive relational aggression. This association was also further explained by anger rumination and trait anger. Although the study made a significant contribution to the adolescent literature, replication of findings using a longitudinal design would provide additional insight into how relationships amongst variables change over time. Further, additional research delineating specific temporal associations between anxiety (global vs. subtypes of anxiety vs. depression) and aggressive behavior (reactive physical vs. reactive relational) is warranted.

It remains unclear whether more covert forms of aggression are linked to specific subtypes of anxiety (i.e., social anxiety) or internalizing disorders more generally. The current study provides evidence that reactive relational aggression is linked to both social anxiety and depression. Prior research also supports an association between reactive relational aggression and more global anxiety as well (Marsee et al., 2008). Investigation of underlying factors that could impact the relationship between internalizing symptoms and reactive relational aggression may be helpful in determining unique associations between constructs. Anger and rumination may be two underlying factors that link depression and social anxiety to reactive relational aggression. Specifically, like socially anxious adolescents, teens with greater levels of depression showed more difficulty managing negative emotions, like anger, and cognitive coping deficits, such as anger rumination. Additionally, Batanova and Loukas (2011) suggest that lower levels of empathy and perspective taking may precipitate the relationship between social anxiety and relational aggression. Given prior research and current study findings, we are beginning to accumulate more varied knowledge of these transdiagnostic factors that may lead to aggressive

behaviors in socially anxious and depressed teens. Nonetheless, additional research is needed to more fully assess differential associations between internalizing disorders and aggressive behavior. Further information of this connection may provide more specific direction for clinical intervention.

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APPENDICES

Appendix A

Community Recruitment Flyer

THE UNIVERSITY OF MAINE

Seeking Youth Ages 14-17 for Research Study
Earn $10 compensation

  Researchers at the University of Maine are looking for research study participants in grades 9 to 12. The purpose of this research is to learn about different thoughts and emotions that teenagers have. Teens would be asked to respond to questions on the computer and just need access to a computer and internet to participate! Compensation for participation is $10. If interested or would like more information, **parents please call 207-581-2061 or email: shannon.brothers@umit.maine.edu.**

Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu	Adolescent Mood & Behavior Project 207-581-2061 shannon.brothers@umit.maine.edu

Appendix B

Community Recruitment Facebook Ad Script

Script for Facebook Ad

Seeking Youth Ages 14-17 for a University of Maine Research Study.
Earn $10 compensation.

Script for Facebook Study Page:

Short Description for Facebook study page:

Seeking Youth Ages 14-17 for a University of Maine Research Study. Earn $10 compensation.

Researchers at the University of Maine are looking for research study participants in grades 9 to 12. The purpose of this research is to learn about different thoughts and emotions that teenagers have. Teens would be asked to respond to questions on the computer and just need access to a computer and internet to participate! Compensation for participation is $10.

If interested or would like more information, **parents please call 207-581-2061, message the Adolescent Mood and Behavior Project page, or email: <u>shannon.brothers@umit.maine.edu</u>.**

Appendix C

Community Recruitment Flyer Facebook

Seeking Youth Ages 14-17 for Research Study.
Earn $10 compensation

Researchers at the University of Maine are looking for research study participants in grades 9 to 12. The purpose of this research is to learn about different thoughts and emotions that teenagers have. Teens would be asked to respond to questions on the computer and just need access to a computer and internet to participate! Compensation for participation is $10.

If interested or would like more information, **parents please call 207-581-2061, message the Adolescent Mood and Behavior Project page, or email: shannon.brothers@umit.maine.edu**

Appendix D

Study Script for Speaking to Community Parents

Purpose of the Study?

We would like learn about different thoughts and emotions that teenagers have. We know high school has its stressful moments for teens, whether it be work, academics, or navigating relationships with friends/peers at school. This study will help us to understand how teens deal with different thoughts and emotions.

What Will Students Be Asked to Do?

Teens will be asked to fill out several surveys online, which will take approximately 30 minutes. The online surveys can be completed at home. Importantly, adolescents' answers on the forms are all anonymous.

Teens will receive a $10.00 e-gift card from Amazon for their time. They can stop participation at any time.

What Will This Process Look Like?

If interested, parents will be sent a secure, password protected link to complete the consent form online. This consent form will ask you to provide your child's name, whether or not you consent, and your child's email address. Once consent is received, we will send a separate, secure study link to your child via email.

Do you have any questions?

Appendix E

Study Script for Speaking to School Personnel

Purpose of the Study?

We would like learn about different thoughts and emotions that teenagers have. We know high school has its stressful moments for students, whether it be work, academics, or navigating relationships with friends/peers at school. This study will help us to understand how teens deal with different thoughts and emotions.

What Will Students Be Asked to Do?

Students will be asked to fill out several surveys online, which will take approximately 30 minutes. The online surveys can be completed during a free period in school or outside of school. Importantly, students' answers on the forms are all anonymous.

Students will receive a $5.00 e-gift card from Target for their time. They can stop participation at any time.

What Will This Process Look Like?

Consents will be mailed out to parents by school personnel, sent home with students, or sent to parents via email by school personnel. Parents (or students 18 years old or older) will be provided with a postage paid return envelope and will be asked to send the consent form back to the principal investigator, Shannon Brothers, at the University of Maine. Parents may also email the principal investigator to consent.

Regardless of whether the students and their parent(s) are OK with them participating, each student who returns their consent form will be entered into a raffle to win one of three $50.00 e-gift cards to Amazon.

If they are interested in the study and their parent gives the OK, they will receive a $5.00 Target e-gift card for participating AND be entered into the raffle to win one of three Amazon e-gift cards!

Do you have any questions?

Appendix F

Sample Email/Letter to School Personnel

[Date]

[Teacher/Principal Name]
[School Address]

Dear Mr./Ms. [Teacher/Principal Name]

My name is Shannon Brothers and I am a doctoral candidate in the Clinical Psychology Program at the University of Maine. Today, I am contacting you to ask for your help on a study that I hope will lead to more awareness on social anxiety in adolescents. Social anxiety is a serious and chronic disorder that impacts up to 15% of youth, with adolescent girls showing the highest rates. It is characterized by unreasonably strong fears of being negatively evaluated by others in social situations. These fears can surround performance, talking with unfamiliar others, or the fear that something embarrassing or humiliating will happen. Additionally, social anxiety has been linked to many negative outcomes, such as fewer peer relationships, depression, substance use and social problems.

Although social anxiety seems to have profound and serious effects on adolescents, youth with social anxiety tend to be overlooked and often do not get the help they need. The goal of the present study is to examine how adolescents with social anxiety express and manage their emotions, and ways their mood can affect how they interact with peers. This knowledge could help psychologists design more effective intervention and treatment programs to address this serious problem.

In this study students will be asked to fill out several surveys online, which will take approximately 30 minutes. Surveys can be completed during a free period at school or outside of school time. Importantly, students' answers on the surveys are anonymous. In the next few days, I will contact you to answer any questions you may have about this study and discuss the possibility of your school's participation in this study during the 2016 school year. This email/letter has also been sent to [guidance counselor/principal's name]. Please feel free to contact me before that time via email at shannon.brothers@umit.maine.edu. I look forward to hearing from you!

Sincerely,

_____

Shannon Brothers, M.A.
Clinical Psychology
University of Maine

Appendix G

Demographic Questionnaire

1. **Age**_____

2. **Grade:** _____

3. **Name of school:** _____

4. **What is your gender identity**?

_____ Female
_____ Female to male transgender
_____ Male
_____ Male to female transgender
_____ Not sure
_____ Other (please specify): _____

5. **Race** (check one):

____ White
____ Black
____ Latino/a
____ Asian
____ American Indian/Native American
____ Other (please specify):_____

5. **How would you describe your sexual orientation?**
_____ Heterosexual (sexually attracted to the opposite sex)
_____ Mostly heterosexual
_____ Bisexual (attracted to both men and women)
_____ Gay or lesbian (attracted to the same sex)
_____ Other _____
_____ I am not sure
_____ I don't understand this question

Appendix H

Social Anxiety Scale for Adolescents (SAS-A)

This is not a test, there are no right or wrong answers. Please answer each item as honestly as you can.

Use these numbers to show HOW MUCH YOU FEEL something is true for you:

1 = Not at all
2 = Hardly ever
3 = Sometimes
4 = Most of the time
5 = All the time

Now let's try these sentences first. How much does each describe how you feel?

a. I like summer vacation....   1 2 3 4 5
b. I like to eat spinach.....   1 2 3 4 5

1. I worry about doing something new in front of others................... 1 2 3 4 5

2. I like to do things with my friends............................... 1 2 3 4 5

3. I worry about being teased... 1 2 3 4 5

4. I feel shy around people I don't know................................. 1 2 3 4 5

5. I only talk to people I know really well.............................. 1 2 3 4 5

6. I feel that peers talk about me behind my back...................... 1 2 3 4 5

7. I like to read.. 1 2 3 4 5

8. I worry about what others think of me................................ 1 2 3 4 5

9. I'm afraid that others will not like me.............................. 1 2 3 4 5

10. I get nervous when I talk to peers I don't know very well.............. 1 2 3 4 5

11. I like to play sports... 1 2 3 4 5

12. I worry about what others say about me................................ 1 2 3 4 5

13. I get nervous when I meet new people.................................. 1 2 3 4 5

14. I worry that others don't like me..................................... 1 2 3 4 5

15. I'm quiet when I'm with a group of people............................. 1 2 3 4 5

16. I like to do things by myself... 1 2 3 4 5

17. I feel that others make fun of me..................................... 1 2 3 4 5

18. If I get into an argument, I worry that the other person will not like me.. 1 2 3 4 5

19. I'm afraid to invite others to do things with me because they might
    say no... 1 2 3 4 5

20. I feel nervous when I'm around certain people......................... 1 2 3 4 5

21. I feel shy even with peers I know well................................ 1 2 3 4 5

22. It's hard for me to ask others to do things with me................... 1 2 3 4 5

Peer Conflict Scale (PCS)

Instructions: Please read each statement and decide how well it describes you. Mark your answer by circling the appropriate number (0-3) for each statement.

	Not at all true	Somewhat true	Very true	Definitely true
1. I have hurt others to win a game or contest	0	1	2	3
2. I enjoy making fun of others	0	1	2	3
3. When I am teased, I will hurt someone or break something	0	1	2	3
4. I gossip about others when I'm angry at them	0	1	2	3
5. I start fights to get what I want	0	1	2	3
6. I deliberately exclude others from my group, even if they haven't done anything to me	0	1	2	3
7. I spread rumors and lies about others when they do something wrong to me	0	1	2	3
8. When someone hurts me, I end up getting into a fight	0	1	2	3
9. I try to make others look bad to get what I want	0	1	2	3
10. When someone upsets me, I tell my friends to stop liking that person	0	1	2	3
11. I threaten others when they do something wrong to me	0	1	2	3
12. When I hurt others, I feel like it makes me powerful and respected	0	1	2	3
13. I tell others' secrets for things they did to me a while back	0	1	2	3
14. When someone threatens me, I end up getting into a fight	0	1	2	3

	Not at all true	Somewhat true	Very true	Definitely true
15. I make new friends to get back at someone who has made me angry	0	1	2	3
16. I hurt others when I'm angry at them	0	1	2	3
17. When others make me mad, I write mean notes about them and pass the notes around	0	1	2	3
18. I threaten others to get what I want	0	1	2	3
19. I gossip about others to become popular	0	1	2	3
20. If others make me mad, I hurt them	0	1	2	3
21. I am deliberately cruel to others, even if they haven't done anything to me	0	1	2	3
22. When I am angry at others, I try to make them look bad	0	1	2	3
23. To get what I want, I try to steal others' friends from them	0	1	2	3
24. I carefully plan out how to hurt others	0	1	2	3
25. When someone makes me mad, I throw things at them	0	1	2	3
26. When I gossip about others, I feel like it makes me popular	0	1	2	3
27. I hurt others for things they did to me a while back	0	1	2	3
28. I enjoy hurting others	0	1	2	3
29. I spread rumors and lies about others to get what I want	0	1	2	3
30. When I have gotten into arguments or physical fights, it is usually because I acted without thinking	0	1	2	3
31. If others make me mad, I tell their secrets	0	1	2	3
32. I ignore or stop talking to others in order to get them to do what I want	0	1	2	3
33. I like to hurt kids smaller than me	0	1	2	3
34. When others make me angry, I try to steal their friends from them	0	1	2	3

	Not at all true	Somewhat true	Very true	Definitely true
35. I threaten others, even if they haven't done anything to me	0	1	2	3
36. When I get angry, I will hurt someone	0	1	2	3
37. I have gotten into fights, even over small insults from others	0	1	2	3
38. When I have started rumors about someone, it is usually because I acted without thinking	0	1	2	3
39. I say mean things about others, even if they haven't done anything to me	0	1	2	3
40. When someone makes me angry, I try to exclude them from my group	0	1	2	3

Appendix J

Anger Rumination Scale (ARS)

Directions: Everyone gets angry and frustrated occasionally but people differ in the ways that they think about their episodes of anger. Statements below describe different ways that people may be recalling or thinking about their anger experiences. Please, read each statement and then respond by circling the appropriate number for each statement. There are no right or wrong answers in this questionnaire, and your honest responses that best describe yourself are very important.

	Almost-Never	Some-times	Often	Almost always
1. I ruminate about my past anger experiences.	1	2	3	4
2. I ponder about the injustices that have been done to me.	1	2	3	4
3. I keep thinking about events that angered me for a long time.	1	2	3	4
4. I have long living fantasies of revenge after the conflict is over.	1	2	3	4
5. I think about certain events from a long time ago and they still make me angry.	1	2	3	4
6. I have difficulty forgiving people who have hurt me.	1	2	3	4
7. After an argument is over, I keep fighting with this person in my imagination.	1	2	3	4
8. Memories of being aggravated pop up into my mind before I fall asleep.	1	2	3	4
9. Whenever I experience anger, I keep thinking about it for a while.	1	2	3	4
10. I have times when I cannot stop being preoccupied with a particular conflict.	1	2	3	4
11. I analyze events that make me angry.	1	2	3	4
12. I think about the reasons people treat me badly.	1	2	3	4
13. I have daydreams and fantasies of violent nature.	1	2	3	4

	Almost-Never	Some-times	Often	Almost always
14. I feel angry about certain things in my life.	1	2	3	4
15. When someone makes me angry, I can't stop thinking about how to get back at this person.	1	2	3	4
16. When someone provokes me, I keep wondering why this should have happened to me.	1	2	3	4
17. Memories of even minor annoyances bother me for a while.	1	2	3	4
18. When something makes me angry, I turn this matter over and over again in my mind.	1	2	3	4
19. I re-enact the anger episode in my mind after it has happened	1	2	3	4

Notes: _____

_____

Appendix K

State-Trait Anger Expression Scale for Children and Adolescents-

Second Edition (STAXI-2 C/A)

INSTRUCTIONS

This survey has three parts. Each part has different instructions for responding to sentences that people use to describe their feelings and behavior. Read the directions for each part carefully before selecting your responses.

For each sentence, please select the number under the answer that describe the best. There are no right or wrong answers. Select only one number for each sentence.

The sentences in Part 1 ask about **how you feel right now.** For the sentences in Part 1, use the following guide:

> Select **1** if you feel this way **Not at all** right now
> Select **2** if you feel this way **Somewhat** right now
> Select **3** if you feel this way **Very much** right now

The sentences in Part 2 ask about **how often you usually feel a certain** way. For the sentences in Part 2, use the following guide:

> Select **1** if you **Hardly ever** feel this way
> Select **2** if you **Sometimes** feel this way
> Select **3** if you **Often** feel this way

The sentences in Part 3 ask about **how often you feel or act a certain way when you are angry**. For the sentences in Part 3, use the following guide:

> Select **1** if you **Hardly ever** feel or act this way when you are angry
> Select **2** if you **Sometimes** feel or act this way when you are angry
> Select **3** if you **Often** feel or act this way when you are angry

Part 1 Directions: The sentences below talk about feelings people sometimes have. Read each sentence below and then select the response that indicates how you feel **right now**. There are no right or wrong answers. Be honest. Do not spend too much time on any sentence.

	Not at all	Somewhat	Very much
1. I feel annoyed	1	2	3
2. I feel angry	1	2	3

3. I feel irritated	1	2	3
4. I feel like shouting out loud	1	2	3
5. I feel like hitting someone	1	2	3
6. I feel like yelling	1	2	3
7. I feel like kicking somebody	1	2	3
8. I feel grumpy	1	2	3
9. I feel like throwing something	1	2	3
10. I am mad	1	2	3

Part 2 Directions: The sentences below talk about feelings people sometimes have. Read each sentence below and then select the response that indicates **how often do you usually feel that way.** There are no right or wrong answers. Be honest. Do not spend too much time on any sentence.

	Hardly ever	Sometimes	Often
11. I feel angry	1	2	3
12. I get mad	1	2	3
13. I get angry quickly	1	2	3
14. I feel annoyed when I do a good job and no one notices me	1	2	3
15. I get mad when I am punished unfairly	1	2	3
16. I feel grouchy	1	2	3
17. I get angry when I do well and am told I did something wrong	1	2	3
18. I feel angry when I am blamed for something I did not do	1	2	3
19. I am hotheaded	1	2	3

	Hardly ever	Sometimes	Often
20. I feel like yelling when I do something good and someone says I did bad	1	2	3

Part 3 Directions: Everyone feels angry from time to time, but people differ in what they do when they are angry. The sentences below talk about how you may feel or act when you are angry. Read each sentence and then select the response that best describes **how often you feel or act that way when you are angry.** There are no right or wrong answers. Be honest. Do not spend too much time on any sentence.

	Hardly ever	Sometimes	Often
21. I show my anger	1	2	3
22. If I do not like someone, I keep it a secret	1	2	3
23. I keep my cool	1	2	3
24. I say mean things	1	2	3
25. I hide my anger	1	2	3
26. I try to relax	1	2	3
27. I lose my temper	1	2	3
28. I keep my anger in	1	2	3
29. I try to calm down	1	2	3
30. I try to calm my angry feelings	1	2	3
31. I get into arguments	1	2	3
32. I do something to relax and calm down	1	2	3
33. I am afraid to show my anger	1	2	3
34. I do things like slam doors	1	2	3
35. I get mad inside, but do not show it	1	2	3

Children's Depression Inventory (CDI)

CDI

Kids sometimes have different feelings and ideas.

This form lists the feelings and ideas in groups. From each group of three sentences, pick one sentence that describes you *best* for the past two weeks. After you pick a sentence from the group, go on to the next group.

There is no right or wrong answer. Just pick the sentence that best describes the way you have been recently. Put a mark like this ☒ next to your answer. Put the mark in the box next to the sentence that you pick.

Here is an example of how this form works. Try it. Put a mark next to the sentence that describes you *best*.

Example: ☐ I read books all the time.

☐ I read books once in a while.

☐ I never read books.

Remember, pick out the sentences that describe you best in the PAST TWO WEEKS.

1. ☐ I am sad once in a while.

☐ I am sad many times.

☐ I am sad all the time.

2. ☐ Nothing will ever work out for me.

☐ I am not sure if things will work out for me.

☐ Things will work out for me O.K.

3. ☐ I do most things okay.

☐ I do many things wrong.

☐ I do everything wrong.

4. ☐ I have fun in many things.

☐ I have fun in some things.

☐ Nothing is fun at all.

5. ☐ I am bad all the time.

☐ I am bad many times.

☐ I am bad once in a while.

6. ☐ I think about bad things happening to me once in a while.

☐ I worry that bad things will happen to me.

☐ I am sure that terrible things will happen to me.

7. ☐ I hate myself.

☐ I do not like myself.

☐ I like myself.

8. ☐ All bad things are my fault.

☐ Many bad things are my fault.

☐ Bad things are not usually my fault.

9. ☐ I feel like crying every day.

☐ I feel like crying many days.

☐ I feel like crying once in a while.

10. ☐ Things bother me all the time.

☐ Things bother me many times.

☐ Things bother me once in a while.

11. ☐ I like being with people.

☐ I do not like being with people many times.

☐ I do not want to be with people at all.

12. ☐ I cannot make up my mind about things.

☐ It is hard to make up my mind about things.

☐ I make up my mind about things easily.

13. ☐ I look O.K.

☐ There are some bad things about my looks.

☐ I look ugly.

14. ☐ I have to push myself all the time to do my schoolwork.

☐ I have to push myself many times to do my schoolwork.

☐ Doing schoolwork is not a big problem.

15. ☐ I have trouble sleeping every night.

☐ I have trouble sleeping many nights.

☐ I sleep pretty well.

16. ☐ I am tired once in a while.

☐ I am tired many days.

☐ I am tired all the time.

17. ☐ Most days I do not feel like eating.

☐ Many days I do not feel like eating.

☐ I eat pretty well.

18. ☐ I do not worry about aches and pains

☐ I worry about aches and pains many times.

☐ I worry about aches and pains all the time.

19. ☐ I do not feel alone.

☐ I feel alone many times.

☐ I feel alone all the time.

20. ☐ I never have fun at school.

☐ I have fun at school only once in a while.

☐ I have fun at school many times.

21. ☐ I have plenty of friends.

☐ I have some friends but I wish I had more.

☐ I do not have any friends.

22. ☐ My schoolwork is alright.

   ☐ My schoolwork is not as good as before.

   ☐ I do very badly in subjects I used to be good in.

23. ☐ I can never be as good as other kids.

   ☐ I can be as good as other kids if I want to.

   ☐ I am just as good as other kids.

24. ☐ Nobody really loves me.

   ☐ I am not sure if anybody loves me.

   ☐ I am sure that somebody loves me.

25. ☐ I usually do what I am told.

   ☐ I do what I am told most times.

   ☐ I never do what I am told.

26. ☐ I get along with people.

   ☐ I get into fights many times.

   ☐ I get into fights all the time.

Appendix M

School Parent Consent

Parent Consent Form

Dear Parent,

Students at your child's school are being asked to participate in a University of Maine research project. The study is being conducted by Shannon Brothers, M.A., a graduate student in the Department of Psychology and Dr. Douglas W. Nangle, a Professor in the Department of Psychology. The purpose of this research is to learn about different thoughts and emotions that teenagers have. Students must be in 9th through 12th grade to participate in this study. Your child's participation will help further our understanding of how teens' mood can impact their expression of emotion and how their mood might affect how they behave in different situations.

What will your child be asked to do during this study?
- If you agree to allow your child participate in this study, your child will be asked to complete several surveys online. Questionnaires will ask each student about how he/she interacts with others in social settings (e.g., I get nervous when I talk to peers I don't know very well) and in what ways he/she may express his/her anger and frustration (e.g., I get angry quickly). Each student will also be asked questions about his/her typical mood (e.g., I feel sad much of the time) and general demographic information (e.g., age, grade, ethnicity, sexual orientation).
  These questionnaires will take approximately 30 minutes to complete and can be completed during a free period in school or outside of school time. Adolescents will be asked to complete surveys online. Your child's email address will be required and used to send him/her the link to complete the online surveys.

What are the risks?
Some questions could make your child feel uncomfortable or distressed. She/he may skip any question that she/he would rather not answer, and can choose to end his/her participation in the study at any time. At the end of the study, each student will receive a list of resources that you might choose to consult with if your child is experiencing high levels of distress. This referral list is also attached to this consent form.

What are the benefits?
Although there may be no direct benefit to you or your child for participating in this research, your child's responses will tell us more about how teens express emotions, and how their mood can affect how they interact with peers. This knowledge could help psychologists design more effective intervention programs for teens who have difficulty expressing emotions and have less effective strategies for interacting with peers.

Is there compensation?
Each student will receive a $5.00 e-gift card to Target for his/her participation. At the end of the survey, participants will be asked to click on a link taking them to a separate survey, which

is not linked to their survey answers, and asked to provide their name and email address in order to receive compensation for the study. Further, he/she will be entered to win one of three $50.00 Amazon e-gift cards for returning his/her consent form, even if you do not want your child to participate. If your child chooses to end his/her participation early, he/she will still receive the $5.00 Target e-gift card.

Will my child's answers be private?

Your child's responses to the questionnaires will be anonymous. Your child's responses will never be linked with his/her name because he/she will not provide his/her name at any point while filling out the online surveys. All data will be stored indefinitely on a password protected computer in a locked office at the University of Maine.

Is this voluntary?

Your child's participation in this study is voluntary. Your child may choose to withdraw from the study at any point and skip any questions that he/she does not want to answer. If your child chooses to end his/her participation early, he/she will still receive the $5.00 Target e-gift card.

Can I provide electronic consent?

Yes. If you would rather provide electronic consent, you may email the principal investigator, Shannon Brothers, at shannon.brothers@umit.maine.edu. **In the body of the email please provide: the student's name, high school they are currently attending, whether you do or do not give consent, and provide the student's email address.** We will then send out the study link to complete surveys via email to only those students who have received parent consent.

If you **do not** give consent, but have provided the student's name and email, they will be entered in the raffle to receive an Amazon e-gift card. These students will only be contacted via email if they are a raffle winner.

Questions or concerns?

If at any time you have questions or concerns about your child's participation in this project, you may contact Shannon.Brothers@umit.maine.edu or Doug.Nangle@umit.maine.edu. If you have any questions about your child's rights as a research participant, please contact Gayle Jones, Assistant to the University of Maine's Protection of Human Subjects Review Board, at (207) 581-1498, or email at Gayle.Jones@umit.maine.edu.

_____   I give permission for my child to participate in this study.

_____   I do NOT give permission for my child to participate in this study.

_____   _____
Student's name (**please print**)   Student's email address

_____ _____

Parent/Guardian signature   Name of Student's School

Appendix N

Community Parent Consent

Parent Consent Form

Dear Parent,

Adolescents are being asked to participate in a University of Maine research project. The study is being conducted by Shannon Brothers, M.A., a graduate student in the Department of Psychology and Dr. Douglas W. Nangle, a Professor in the Department of Psychology. The purpose of this research is to learn about different thoughts and emotions that teenagers have. Adolescents must be in 9th through 12th grade to participate in this study. Your child's participation will help further our understanding of how teens' mood can impact their expression of emotion and how their mood might affect how they behave in different situations.

What will your child be asked to do during this study?
- If you agree to allow your child participate in this study, your child will be asked to complete several surveys online. Questionnaires will ask each student about how he/she interacts with others in social settings (e.g., I get nervous when I talk to peers I don't know very well) and in what ways he/she may express his/her anger and frustration (e.g., I get angry quickly). Each student will also be asked questions about his/her typical mood (e.g., I feel sad much of the time) and general demographic information (e.g., age, grade, ethnicity, sexual orientation).
These questionnaires will take approximately 30 minutes to complete. Adolescents will be asked to complete surveys online. Your child's email address will be required and used to send him/her the link to complete the online surveys.

What are the risks?
Some questions could make your child feel uncomfortable or distressed. She/he may skip any question that she/he would rather not answer, and can choose to end his/her participation in the study at any time. At the end of the study, each student will receive a list of resources that you might choose to consult with if your child is experiencing high levels of distress. This referral list is also attached to this consent form.

What are the benefits?
Although there may be no direct benefit to you or your child for participating in this research, your child's responses will tell us more about how teens express emotions, and how their mood can affect how they interact with peers. This knowledge could help psychologists design more effective intervention programs for teens who have difficulty expressing emotions and have less effective strategies for interacting with peers.

Is there compensation?
Your child will receive a $10.00 e-gift card to Amazon for his/her participation. At the end of the survey, participants will be asked to click on a link taking them to a separate survey, which is not linked to their survey answers, and asked to provide their name and email address in

order to receive compensation for the study. If your child chooses to end his/her participation early, he/she will still receive the $10.00 Amazon e-gift card.

Will my child's answers be private?

Your child's responses to the questionnaires will be anonymous. Your child's responses will never be linked with his/her name because he/she will not provide his/her name at any point while filling out the online surveys. All data will be stored indefinitely on a password protected computer in a locked office at the University of Maine.

Is this voluntary?

Your child's participation in this study is voluntary. Your child may choose to withdraw from the study at any point and skip any questions that he/she does not want to answer. If your child chooses to end his/her participation early, he/she will still receive the $10.00 Amazon e-gift card.

Questions or concerns?

If at any time you have questions or concerns about your child's participation in this project, you may contact Shannon.Brothers@umit.maine.edu or Doug.Nangle@umit.maine.edu. If you have any questions about your child's rights as a research participant, please contact Gayle Jones, Assistant to the University of Maine's Protection of Human Subjects Review Board, at (207) 581-1498, or email at Gayle.Jones@umit.maine.edu.

_____   I give permission for my child to participate in this study.

_____   _____
Student's name (**please print**)   Student's email address

_____
Parent/Guardian signature

Appendix O

School Informed Assent

We are doing a study to help us learn about different thoughts and emotions that teenagers have. This study will help us to learn about how teens' mood can impact the way they express emotions and how they behave in different situations.

You will be filling out several surveys, which will take approximately 30 minutes. Some of the questions may make you feel uncomfortable; if this happens, it is fine for you to skip questions. You will receive a $5.00 e-gift card to Target for your participation. At the end of the survey, you will be asked to click on a link taking you to a separate survey, which is not linked to your survey answers, and asked to provide your name and email address in order to receive compensation for the study. If you decide that you do not want to do the study anymore, you will still receive a $5.00 e-gift card. If you become upset when you answer any of the questions, we ask that you talk to your parents or school counselor. At the end of the surveys, you will be provided with a referral list with phone numbers in case you decide later that you would like to talk with someone about feelings of distress that you might be having.

Your answers on the surveys are all anonymous. You will not put your name on any surveys, so we will have no idea how you responded to the questions. I will not share the surveys with your parents or anyone at your school.

Questionnaires will ask you about how you interact with others in social settings (e.g., I get nervous when I talk to peers I don't know very well) and in what ways you may express your anger and frustration (e.g., I get angry quickly). You will also be asked questions about your typical mood (e.g., I feel sad much of the time) and general demographic information (e.g., age, grade, ethnicity, sexual orientation).

There are no right or wrong answers, we just want to know what you think and how you feel.

If you are interested in doing the study, please click on the arrow button to move to the next page to start the survey. Doing so indicates you are interested in doing the study.

If you are NOT interested, please close out of this webpage.

Appendix P

Community Informed Assent

We are doing a study to help us learn about different thoughts and emotions that teenagers have. This study will help us to learn about how teens' mood can impact the way they express emotions and how they behave in different situations.

You will be filling out several surveys, which will take approximately 30 minutes. Some of the questions may make you feel uncomfortable; if this happens, it is fine for you to skip questions. You will receive a $10.00 e-gift card to Amazon for your participation. At the end of the survey, you will be asked to click on a link taking you to a separate survey, which is not linked to your survey answers, and asked to provide your name and email address in order to receive compensation for the study. If you decide that you do not want to do the study anymore, you will still receive a $10.00 e-gift card. If you become upset when you answer any of the questions, we ask that you talk to your parents or school counselor. At the end of the surveys, you will be provided with a referral list with phone numbers in case you decide later that you would like to talk with someone about feelings of distress that you might be having.

Your answers on the surveys are all anonymous. You will not put your name on any surveys, so we will have no idea how you responded to the questions. I will not share the surveys with your parents.

Questionnaires will ask you about how you interact with others in social settings (e.g., I get nervous when I talk to peers I don't know very well) and in what ways you may express your anger and frustration (e.g., I get angry quickly). You will also be asked questions about your typical mood (e.g., I feel sad much of the time) and general demographic information (e.g., age, grade, ethnicity, sexual orientation).

There are no right or wrong answers, we just want to know what you think and how you feel.

If you are interested in doing the study, please click on the arrow button to move to the next page to start the survey. Doing so indicates you are interested in doing the study.

If you are NOT interested, please close out of this webpage.

Appendix Q

School Thank You

Thank you for your time and for participating in this study! Your responses will help us to better understand the how teens cope with different thoughts and emotions. To receive your $5.00 Target e-gift card, please click on the following link: https://umaine.qualtrics.com/SE/?SID=SV_e2Jz19zwXMuVqxD

As a note, this link is not connected to your survey answers in any way and cannot be linked back to you.

Appendix R

Community Thank You

Thank you for your time and for participating in this study! Your responses will help us to better understand the how teens cope with different thoughts and emotions. To receive **your** $10.00 **Amazon e-gift card, please click on the following link:** https://umaine.qualtrics.com/SE/?SID=SV_0fGGjZKN0auaQV7

As a note, this link is not connected to your survey answers in any way and cannot be linked back to you.

Resource List

If you are experiencing any distress after completing the questionnaires and would like to seek counseling, below are resources you may find helpful. We would also encourage you to speak with your school counselor and parents for additional support.

Counseling Services		
Community Health & Counseling Services **42 Cedar Street** **Bangor, ME 04401** (Any costs are your responsibility)	**207-947-0366** http://www.chcs-me.org/	Weekdays 8:00 am-5:00 pm
Northeast Crisis Services (Any costs are your responsibility)	**1-888-568-1112** **http://www.chcs-me.org/index.php?id=2&sub_id=119**	7 days/week 24 hours
Psychological Services Center **330 Corbett Hall** (sliding fee scale)	**207-581-2034** **http://umaine.edu/clinicalpsychology/psychological-services-center/**	Weekdays 8:00 am – 4:30 pm
Contact Your Primary Care Provider (Any costs are your responsibility)		

NATIONAL RESOURCES
Mental Health Services Locator http://store.samhsa.gov/mhlocator
National Suicide Prevention Lifeline, Toll-Free, 24-hour Hotline, 1-800-273-TALK (1800-273-8255)

Appendix T

School e-Gift Card

Please enter your name and email address below to receive your $5.00 Target e-gift card. You will receive your e-gift card within one week of completing the survey.

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Appendix U

Community e-Gift Card

Please enter your **name and email address** below to receive your $10.00 Amazon e-gift card. You will receive your e-gift card within one week of completing the survey.

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BIOGRAPHY OF THE AUTHOR

Shannon Brothers was born and raised in Canton, Ohio with her parents and two older brothers. She went on to attend the University of Toledo to obtain her Bachelor's of Arts degree in Psychology with a minor in Spanish. Subsequent to her undergraduate studies, Ms. Brothers received an Intramural Research Training Award at the National Institutes of Mental Health and completed a two-year research fellowship in Bethesda, Maryland. The fellowship research focused on understanding comorbid mental and physical health conditions within families. She later obtained a position at the Hospital of the University of Pennsylvania as a clinical research coordinator and was involved in a large epidemiological research study, which examined how mental health disorders present in youth. In 2012, she accepted a position within the University of Maine's clinical psychology program, developmental-clinical track. This specialized track focuses on understanding normative and atypical development in children and adolescents, as well as contextual and environmental factors that may impact the development of psychopathology. Ms. Brothers attended clinical internship at the Indiana University School of Medicine, with a child clinical/pediatric health focus. She recently accepted a post-doctoral fellowship at C.S. Mott Children's Hospital focused on inpatient consultation-liaison and outpatient pediatric health. She is a candidate for the Doctor of Philosophy degree in Psychology with a concentration in Clinical Psychology from the University of Maine in August 2018.