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Hostile Attributional Bias in Aggression and Anxiety: The Role of Perceived Provocateur Motivation

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Dedication

This paper would not have been possible without the help and support of many colleagues, friends, and family. Many thanks are deserved.

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Abstract

Although internalizing and externalizing problems are often considered in isolation from one another, the frequently co-occur in individuals leading to unique behavior profiles. The current study examined the associations between the forms, functions, and subtypes of aggression, anxiety, hostile attributional bias (HAB), and perceived (proactive or reactive) provocateur motivation in a sample of youth (mean age = 13.84 years, 51% male, 37.5% Caucasian). Results indicated that only reactive relational aggression significantly predicted anxiety, while relational and reactive aggression did not. HAB was not significantly associated with either anxiety or any type of aggression. Perceived proactive provocateur motivation was significantly associated with anxiety, but not aggression, and reactive motivation was not significantly associated with either. Theoretical and clinical implications are discussed.

Keywords: *Hostile Attributional Bias, Aggression, Anxiety, Provocateur Motivation*

Hostile Attributional Bias in Aggression and Anxiety:

The Role of Perceived Provocateur Motivation

Research suggests that internalizing and externalizing symptoms are often comorbid in children (Costello, Egger, & Angold, 2004), leading to complex affective, cognitive, and behavioral difficulties that are likely to manifest uniquely in each individual. As such, further investigation into the unique relationships between internalizing and externalizing symptoms is essential to better inform intervention strategies with youth who exhibit such problems. Better intervention strategies are especially needed for severe externalizing behaviors such as childhood aggression and violence, as these behaviors are associated with a host of social and psychological problems in both aggressors and victims (Huesmann, Dubow, & Boxer, 2009). In addition to understanding the patterns of overlap and divergence between internalizing and externalizing problems, investigation into potential mechanisms that facilitate such patterns is also warranted. Clearer knowledge of just how these specific patterns come into existence will undoubtedly aid in the formulation of unique, individualized, and ultimately more effective treatment. The present paper seeks to more clearly outline the relationships of internalizing and externalizing behaviors with the goal of locating a specific cognitive mechanism to target in interventions for youth exhibiting these behavior problems.

Aggression: Forms, Functions, and Subtypes

The term "aggression" encompasses a wide variety of behaviors and motivations. From spreading nasty rumors about a girl because she called you 'fat' to breaking a boy's nose so he'll give you his lunch money, the term 'aggression' can account for any number of harms (Little, Jones, Henrich, & Hawley, 2003). In order to effectively curb the risks associated with both

giving and receiving aggression, a much clearer understanding of this construct as a whole, as well as its array of more specific incarnations is necessary.

Buss (1961) defined aggression as "a response that delivers noxious stimuli to another organism." Later, Coie and Dodge (1998) supported a more socially defined version of aggression: acting with intent to harm. Although this definition has been difficult to utilize in studies with infants and nonhuman animals (Kagan, 1974; Tremblay, 2000), it is apparently suitable for most aggression development research, especially that with an emphasis on the social-cognitive aspects of aggression (e.g., Crick & Dodge, 1994; Hughes, Meehan, & Cavell, 2004). There has been much debate over which definition is "correct" and the simplest solution appears to follow Bandura's (1973) advice, using a more specific definition tailored to the research question at hand (Tremblay, 2000). The first step in following this advice, then, is to break the aggression construct down further into its specific forms, functions, and subtypes.

Overt and relational aggression forms.

In terms of the forms aggression can take, there is evidence for two major categories. Overt aggression, which has been defined as verbal and physical behavior that is directed at and individual with intent to harm the target (e.g., Buss & Perry, 1992; Coie & Dodge, 1998) and consists of actions such as hitting, kicking, threatening, teasing (to the person's face), and biting. A great deal of what may now be considered the pioneering work of socially-learned aggression (e.g., Bandura, 1973; Dodge, 1980) examined this form exclusively. In relational aggression, the other form, the intent is to harm individuals through their social relationships (Crick & Grotpeter, 1995). This construct accounts for actions that are often more covert such as purposeful exclusion, ostracism, spreading rumors and gossiping. Although relational aggression can involve some direct confrontations such as deliberately not speaking to a person, the heart of this

construct lies in harm caused through manipulation of social standing. There has been much debate surrounding the term relational aggression when describing these behaviors. Other researchers have referred to these actions as indirect (e.g., Lagerspetz, Björkqvist, & Peltonen, 1988) and social (e.g., Galen & Underwood, 1997). Although the researchers attached to one of these specific terms will be quick to argue their importance as unique constructs, Bjorkqvist (2001) has asserted that these definitions, though fitted with different names, refer to the same phenomenon: aggression carried out through social manipulation. For the purposes of consistency, this form of aggression will be referred to as 'relational' for the duration of this paper.

Research has consistently shown that, although these constructs are often moderately correlated (e.g., Crick & Grotpeter, 1995), they are in fact distinct from one another (for a review see Card, Stucky, Sawalani, & Little, 2008). In a longitudinal confirmatory factor analysis, Vaillancourt, Brendgen, Boivin, and Tremblay (2003) found evidence for this two-factor model over three 2-year time periods in a sample of Canadian children (ages ranged from 4-7 at the beginning and 8-11 at the end). They found that this model was stable across time, cohort, and gender, and that children appeared to show stable patterns of aggression (i.e., those that were originally more relationally aggressive at Time 1 showed more relational aggression at Time 2 and Time 3). Additionally, Grotpeter and Crick (1996) performed a factor analysis on a peer nomination measure designed to distinguish the two forms of aggression from each other as well as from prosocial behavior. They found that the items on this measure loaded cleanly onto the three separate categories. In addition to factor analysis, many other unique differences between the forms have been found.

Perhaps the most notable distinctions between overt and relational aggression have been made in terms of gender (Hadley, 2003). For example, Crick, Bigbee, and Howes (1996) found that relational aggression was more strongly associated with anger and intent to harm for girls, but physical aggression was more strongly associated for boys. Crick (1997) also argued that relational aggression is more typical of girls than boys. This supposition has been somewhat supported by numerous follow-up studies. Most notably, Werner and Crick (2004) found that higher levels of rejection and friends' relational aggression predicted increases in relational aggression for girls only. They found similar results with physical aggression for boys. In a recent meta-analysis of 148 studies on relational and overt aggression, Card et al. (2008) found that the effect of gender on overt aggression ($r = .29$) was much larger than the effect of it on relational aggression ($r = -.03$), which they deemed significant but negligible. They also found that the strength of the gender effect varied by who was reporting the aggression, with stronger overt differences reported by peer nominations, and stronger relational differences reported by parents and teachers. They speculated that this result might be because boys and girls may actually engage in more similar rates of relational aggression (as self-reported). They argued that third-party observers could impose a stronger gender difference in their reporting of aggression as a result of well-developed gender schemas that perpetuate the notion that girls are much more relationally aggressive than boys.

In addition to gender differences in the forms of aggression, outcome distinctions have also been found. Crick and Grotpeter (1995) found that the relationally aggressive children in their study were significantly more rejected, reporting significantly higher levels of loneliness, depression and isolation than nonaggressive peers. In a longitudinal study, Crick (1996) also found that relational aggression uniquely predicted social maladjustment (defined as rated as

'disliked' by peers and 'not accepted by peers' by teachers) beyond that predicted by overt aggression alone. Again, though, the Card et al. (2008) meta-analysis results suggest that the effects of aggression type on problems in peer relations is stronger for overt than for relational aggression. These varying findings may be reconciled by another Crick (1997) study, which found that children who engaged in gender nonnormative aggression (i.e., relationally aggressive boys and overtly aggressive girls) displayed more social maladjustment than those who utilized the gender normative form of aggression.

Proactive and reactive aggression functions.

Beyond the outward manifestations aggression can take, different internal motivations that can drive those forms have also been distinguished. Currently there are agreed upon functions that aggression can serve. First distinguished by Pulkkinen (1969) as "offensive" and "defensive" aggression, and more recently described by Dodge and Coie (1987) as proactive and reactive, the two functions of aggression work to explain why an individual is aggressive. Proactive aggression, also referred to as instrumental aggression, is deliberate and controlled by a mechanism of reinforcement. In other words, proactive aggression is involves a positive gain for the aggressor (e.g., money, social dominance, etc.). Reactive aggression, on the other hand, does not involve any reinforcement and, instead, is often a hostile response to perceived provocation from another. In the current research, it is often helpful to distinguish these functions by asking the question "Was the aggression provoked?" In the case of the reactive subtype, the answer is yes. The goal of reactive aggression is best conceptualized as person-directed, while that of proactive aggression is object-directed or goal-directed (Dodge, Lochman, Harnish, Bates & Petit, 1997).

As with the forms of aggression, the functions are also highly correlated. Card and Little's (2006) meta-analysis of 42 studies of the functions of aggression in child and adolescent samples yielded an average (median) correlation of $r = .68$. Still, the functions have been shown to be unique and separate constructs in factor analytic studies (e.g., Day, Bream, & Pal, 1992; Poulin & Boivin, 2000) as well as an array of other empirical investigations that will be detailed shortly. The high correlation between proactive and reactive aggression may be due to an asymmetrical overlap in the functions (i.e., some individuals are both proactively and reactively aggressive, some are only reactive, and very few are exclusively proactive; e.g., Camodeca, Goossens, Terwogt, & Schuengel, 2002) In 1997, Dodge et al. found that children classified as reactive, proactive, pervasive (combined proactive and reactive), and nonaggressive showed unique profiles in an analysis of developmental history, adjustment in peer relations, and social information processing (SIP) patterns. Specifically, they found that proactively aggressive children anticipated positive outcomes for aggressive behavior and that reactively aggressive children showed inadequate encoding and problem-solving processing patterns. They also found that reactively aggressive children had histories of physical abuse, earlier onset of problems and more problems in peer relations. In a recent meta-analysis, Card and Little (2006) found that, like the forms of aggression, the functions are also moderately correlated. Still, they found unique associations for the functions. Proactive aggression did not appear to correlate strongly with any of their outcomes. Reactive aggression, however, was more strongly correlated with internalizing problems, emotional dysregulation, low peer acceptance, high peer rejection, and more peer victimization. Here, then, it is important to note the effects of the functions of aggression on social maladjustment. This relationship has been a central focus in the current bullying/victimization literature.

Some of the more notable research on the aggression of bullies has examined differences in the functions of aggression and bully/victim status. Roland and Idsøe (2001) found that both proactive and reactive aggression were associated with bullying others and being bullied at the fifth grade level, but that the relationship between proactive aggression and bullying others was much stronger than that for reactive aggression at the eighth grade level. These results are similar to those found by Camodeca et al. (2002). Their results suggested that although bullies were shown to be both reactively and proactively aggressive, predominantly reactively aggressive individuals were much more likely to be stable victims or bully-victims. The term bully-victim, greatly elaborated by Schwartz, Proctor, and Chien (2001), describes individuals who are prone to more aggressive and hostile behaviors and are both victimized and aggressive. These children appear to be at greater risk for social rejection, so this construct may offer a good explanation for the stronger association of social maladjustment with reactive aggression.

Form/Function subtypes of aggression.

In most of the current literature, distinctions have only been made between either overt/relational aggression (e.g., Crick, 1996; Werner & Crick, 2004) or proactive/reactive aggression (e.g., Dodge, et al., 1997; Roland & Idsøe, 2001). Examinations of both the forms and functions of aggression, however, suggest that the two are indeed separate from one another (Little et al., 2003; Fite, Stauffacher, Ostrov, & Colder, 2008). These studies assert that relational and overt aggression are "pure forms" that have directly observable indicators (i.e., distinct behaviors). Reactive and proactive aggression, referred to as "second-order constructs" are not distinguished by behaviors and therefore not directly observable. Simply put, the forms of aggression can be defined by behavior whereas the functions are distinguished based on unobservable, internal motivations. These two facets of aggression exist separately from one

another and, as a result, every aggressive act will be comprised of both: an action and a motivation, a form and a function.

Often described as cross products of the forms and functions, research suggests that there are four specific subtypes of aggression. Each subtype consists of an outward manifestation (overt or relational) and an internal motivation (proactive or reactive). In other words, each contains both form as well as function (proactive overt, reactive overt, proactive relational, and reactive relational). A recent (2011) factor analyses by Marsee et al. suggests that this model for conceptualizing aggression fits well for both boys and girls, as well as across high school, detained, and residential samples. Additionally, their study found that these subtypes showed expected associations with known correlates (e.g., arrest history, callous-unemotional traits, and delinquency).

Based on the information present on these subtypes, they do in fact appear to be legitimate constructs with unique associations. For example, Bailey and Ostrov (2008) found specific gender effects for the subtypes of aggression, with males reporting significantly more reactive physical and proactive physical aggression than females. Marsee and Frick (2007) noted unique cognitive and emotional correlates for these subtypes in a sample of detained girls as well. Their results suggested that the reactive subtypes of aggression were uniquely associated with poor emotion regulation, while the proactive subtypes (especially proactive relational aggression) were uniquely associated with callous-unemotional traits and biased outcome expectations. Further, Marsee, Weems, and Taylor (2008) found distinct relations between the subtypes, gender, and internalizing problems. Specifically, they found that the relationship between anxiety and reactive relational aggression that was particularly strong for boys. This last finding in particular lends some strong support to the notion that internalizing behaviors may

differentially overlap with the various manifestations of aggression, leading to unique behavioral profiles depending on the aggression type and presence/absence of anxiety.

The Overlap Between Anxiety and Aggression

Generally defined as the anticipation of a future threat (APA, 2013), anxiety (and its associated disorders) is characterized by physical, cognitive, emotional, and behavioral symptoms. Conceptualized as an aberration of the normal anxiety response system (Barlow, 2002), physical symptoms of anxiety problems involved a heightened amount of physiological arousal (i.e., elevated heart rate, breathing, and skin conductance; Anderson & Hope, 2009; Noteboom, Barnholt & Enoka, 2001). Cognitive and emotional symptoms include overestimation of threat/danger (APA, 2013), biased interpretation, memory, and attention (Weems & Watts, 2005), negative affect, and distress/impairment related to physiological arousal (Weems & Silverman, 2008). A common behavioral symptom is avoidance of the perceived threat (APA, 2013). Anxiety problems have been linked to depression (Brown, Campbell, Lehman, Grisham, & Mancill, 2001), social withdrawal/impairment (Goodwin, Fergusson, & Horwood, 2004; Langley, Bergman, McCracken, & Piacentini, 2004), and relational victimization (Gros, Stauffacher Gros, & Simms, 2010.

Given this basic description, anxiety appears to be a construct inconsistent with aggressive behavior. The truth, however, is much more complicated. Although frequently studied in isolation from one another, research suggests that anxiety and aggression are often linked (Costello et al., 2004). Individuals with comorbid internalizing and externalizing behaviors present a very different case than those experiencing either construct alone (Marsee et al., 2008). In a review of studies linking social anxiety to aggression, Kashdan and McKnight (2010) argue that these anxious/aggressive individuals experience more negative outcomes including

increased risky behavior, problems managing negative emotions, less social support, and failing to respond to treatment (Kashdan, Elhai, & Breen 2008; Kashdan & Hoffman, 2008; Kashdan, Zvolensky, & McLeish, 2009). Given the multifaceted nature of aggression, this link to anxiety is likely even more complicated. Numerous studies suggest that anxiety shows unique patterns of comorbidity with specific forms, functions, and subtypes of aggression.

Anxiety and the forms of aggression.

With regards to the forms aggression takes, anxiety strongly favors relationally aggressive individuals. Research examining associations between anxiety and overt aggression consistently find an inverse relationship, with high levels of anxiety associated with lower rates of overt aggression and vice versa (e.g., Broman-Fulks, McCloskey, & Berman, 2007; Loukas, Paulos, & Robinson, 2005). For example, Terranova, Morris, and Boxer (2008) found that low levels of fear reactivity significantly predicted higher future levels of overt, but not relational, bullying in a sample of middle school students over the course of a school year. They argue that this low reactivity contributed to the increase in overt bullying, as these youth were unlikely to be discouraged from initiating aggressive interactions by the potential for negative outcomes. They also posit that relational bullying is more likely dictated by social and cognitive mechanisms instead of fear reactivity, given the more socially complex nature of this construct.

Given the social nature of relational aggression, numerous studies examining *social* anxiety specifically and the forms of aggression have found significant links between the constructs. For example, Loudin, Loukas, and Robinson (2003) found that fear of negative evaluation was a unique predictor of relational aggression in a sample of college students. They argue that relationally aggressive behaviors are more likely to minimize direct confrontation and maximize anonymity, and therefore would be the preferred method for individuals with social

anxiety. Duncan and Owen-Smith (2006) examined social anxiety as it related to relational aggression in same-gender friendships in a sample of college students. They found that greater anxiety about one's status in a friendship was significantly linked to greater use of relationally aggressive strategies in that friendship for both men and women. Similarly, Loukas et al. (2005) found that social evaluative anxiety was uniquely positively associated with relational aggression for both genders in a sample of early adolescents (10-14 years old). Like Loudin et al., they argue that youth experiencing social anxiety are more likely to use relational aggression as a covert retaliatory strategy. Notably, all of these findings highlight the need to expand beyond the notion of gender effects as the "end of story" (Yoder & Kahn, 2003) when examining the forms of aggression. Specifically, Duncan and Owen-Smith state that understanding social contextual factors (e.g., one's status in a particular relationship) are just as, if not more important to understanding aggressive behavior. In other words, the motivation driving the action is just as significant as the form the action takes.

Anxiety and the functions of aggression.

In addition to the different forms of aggression, research has demonstrated substantial evidence for two functions of aggression. While relational and overt aggression are often explained in terms of specific behaviors, proactive and reactive aggression are much better described in terms of emotions and cognitions (Arsenio, Adams, & Gold, 2009). As with the forms of aggression, research suggests that anxiety also differentially relates to the functions of aggression. Specifically, studies examining the overlap between the functions of aggression and anxiety suggest that anxious behaviors are often associated with reactive, but not proactive aggression (Vitaro, Brendgen, & Tremblay, 2002).

In 2008, Marsee linked reactive aggression to Hurricane Katrina exposure via emotional dysregulation brought on by post-traumatic stress disorder (PTSD) symptoms. She argued that these results emphasize the importance of considering the potential for externalizing problems in addition to the more-commonly treated internalizing ones following a disaster. While constructing and testing the Reactive-Proactive Aggression Questionnaire, Raine et al. (2006) found that reactive aggression, but not proactive aggression, was uniquely characterized by social anxiety at age 16 in a sample of adolescent boys. A ten-year longitudinal study by Fite, Raine, Stouthamer-Loeber, Loeber, and Pardini (2010) found that reactive aggression was uniquely associated with anxiety in adulthood. They argued that both reactive aggression and anxiety are likely driven by similar underlying mechanisms such as difficulties with emotion regulation and cognitive biases, which are not present in exclusively proactively aggressive individuals.

Anxiety and the subtypes of aggression.

Recent aggression research has investigated the "cross-products" of the forms and functions of aggression and enthusiasts of this approach argue for the importance of considering the impact of correlates associated with either form or function together. Research in this area, though very limited, has demonstrated some unique relationships for the subtypes of aggression and anxiety. For example, Marsee et al. (2008) found that there was an association between anxiety and only reactive relational aggression in a sample of youth (mean age 11.09 years). They argue that this finding further reinforces previous research establishing the links between anxiety and relational and reactive aggression separately. Additionally, they assert that these results support the subtype model of aggression as a viable option for future research. Marsee et al.'s results also indicated gender moderation such that males with high anxiety showed

significantly more reactive relational aggression than males with low anxiety or girls. These findings are akin to those of Duncan and Owen-Smith (2006) with anxiety and relational aggression in a college sample. Similarly, Marsee et al. argue that boys are equally, if not more likely than girls to respond with relational aggression when anxious, emphasizing the importance of extending beyond the notion of gender when examining aggressive behavior.

Taken together, the preliminary research on the co-occurrence of anxiety and aggression described in the preceding paragraphs suggest that there may in fact be differing relationships between internalizing symptoms of anxiety and externalizing symptoms of these specific types of aggression such that anxiety seems to co-occur more frequently with relational aggression (Crick 1995; Storch, Bagner, Geffken, & Baumeister, 2004), reactive aggression (Fite et al. 2010), and reactive relational aggression (Marsee et al. 2008). Reasoning follows that considering the presence or absence of anxious behavior may aid in determining the specific type of aggression present in clinical settings, which will be useful in aiding treatment planning. How is it that these different associations come about in individuals? What makes one child anxious and relationally aggressive, while another child aggresses proactively but shows no signs of anxiety? One potential avenue to disentangle this configuration of overlap and divergence may be to examine underlying cognitive mechanisms that connect or differentiate anxiety and the forms/functions/subtypes of aggression (Kunimatsu & Marsee, 2012). In short, research must focus on potential mediators in the association between anxiety and aggression. A prominent construct in both the anxiety and aggression literature is the hostile attributional bias (HAB).

Hostile Attributional Bias

Defined as the tendency to interpret an ambiguous provocation as intentional and negative (Dodge, 1986), HAB is a major staple in the study of social-information processing

(SIP) and its relationship to maladaptive behavior as this construct in particular synthesizes social-environmental variables with individual factors in determining behavior (Prinstein, Cheah, & Guyer, 2005). As conceptualized today, HAB is a deficit in the second stage in Crick and Dodge's (1994) SIP model, where individuals assess an ambiguous situation and decide whether or not the provocateur was acting intentionally. Imagine a student running down a classroom aisle and knocking some books off of another student's desk. The intention of this action is unclear, but the student sitting at the desk may interpret it in a variety of ways. Whereas a "normal" individual is more likely to attribute the negative outcome to a benign reason (i.e., an accident), individuals with HAB are more likely to assume the act was intentional (i.e., "being mean"). Interestingly, HAB is linked to both aggression and anxiety difficulties (Reid, Salmon, & Lovibond, 2006).

HAB and aggression.

The first studies of this construct (focusing solely on the overt form of aggression and often using only boys in their samples) consistently found that aggressive individuals were much more likely to interpret ambiguous situations as intentional (i.e., show greater HAB) than their nonaggressive peers (e.g., Dodge & Frame, 1982; Dodge, Murphy, & Buchsbaum, 1984; Dodge & Newman, 1981). Additionally, some of these early findings suggest that HAB is predictive of retaliatory aggression (Dodge, 1980). Thus it seems that HAB may play a causal role in the development of aggression in childhood and adolescence (Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Since then, countless studies have followed, examining the potential effects of HAB on the different forms, functions, and even subtypes of aggression. Overall, the results of this research suggest that HAB has specific relationships with both the forms and functions of aggression and, potentially, the subtypes as well.

When investigated in relational and overt aggression, the nature of individuals' HAB appears to depend on their dominant form used. Crick, Grotpeter, and Bigbee (2002) found that children were more likely to exhibit HAB for only certain situations, depending on the form of aggression used in a series of hypothetical stories. Their results suggest that relationally aggressive individuals are more hostile towards ambiguous relational provocations (e.g., hearing two classmates talk about a party you have not been invited to) and overtly aggressive individuals are more hostile towards overt provocations (e.g., getting bumped from behind and falling into a puddle). Additionally, Crick (1995) found that relationally aggressive individuals reported significantly higher levels of distress for relational provocation situations. She posited that this distress may have been what led participants to interpret the situation as hostile or that responding to this situation aggressively may be their way of coping with that distress. Her second suggestion is very interesting because it alludes to a defensive response to provocation where HAB is concerned. This supposition has been strongly supported by HAB research focusing on the proactive and reactive functions of aggression

Between the proactive and reactive functions of aggression, HAB appears to be more strongly associated with the latter. Dodge and Coie (1987) found that only boys rated high on reactive or a combination of reactive and proactive aggression showed hostile interpretations of intent when presented with videotapes depicting situations of victimization where the provocateur's intent was ambiguous. They also demonstrated that HAB was positively correlated with the rate of reactive, but not proactive, aggression observed during the boys' free play. These results support Dodge's (1980) earlier argument regarding the link between HAB and aggressive responding. In this case, though, the response was only reactive in nature, not proactive. In a study designed to replicate these results in a mixed gender sample, Crick and Dodge (1996)

found that reactively aggressive children did indeed attribute more hostile intentions to ambiguous peer provocations. They also demonstrated that this bias was not present in proactively aggressive individuals as have several other studies (e.g., Dodge, Coie, Petit, & Price, 1990; Katsurada & Sugawara, 1998). So it seems that HAB is a very useful mechanism for distinguishing between the functions of aggression. Things become more complicated, however, when the functions are combined with the forms.

Studies investigating the role of HAB in the four subtypes of aggression are limited and results so far have been mixed. As mentioned earlier, Bailey and Ostrov (2008) found that reactive relational aggression was associated with HAB for relational situations and that reactive overt aggression was associated with HAB for overt situations in a sample of emerging adults. Considering the results of studies focusing exclusively on either the forms or functions of aggression, this finding is not surprising. If reactive aggression has been more strongly associated with HAB (e.g., Crick & Dodge, 1996) and individuals engaging in either relational or overt aggression have demonstrated situation specific hostilities (e.g., Crick et al., 2002), then it only seems logical that these associations would hold for the cross products of these constructs as well. However, studies seeking these results in children and adolescents have yet to find them. Crain, Finch, and Foster (2005) sought to find a predictive relationship between hostile attributions for relational provocations and likelihood of relational aggression in a sample of fourth-to sixth-grade girls. When they failed to find a significant relationship, they also decided to examine that for HAB for overt provocations and likelihood of overt aggression. Those results were also nonsignificant. They attributed their findings both to the potential normative nature of the vignettes chosen (i.e., the stories were ones that would elicit an aggressive response from generally nonaggressive girls, but not from highly aggressive girls), as well as issues in their

measurement of HAB. They argued that using a three-point rating scale (0 = not trying to be mean, 1 = maybe trying to be mean, 2 = definitely trying to be mean) may have been too limiting for their participants to respond with. As mentioned earlier, Marsee and Frick (2007) were unable to find any association between HAB and aggression. They suggested that their results may have been due to a small sample size (n = 58). However, given the unique nature of their sample (predominantly African American detained girls), their results may be attributable to a potential flaw in HAB measurement. It is possible that the means by which HAB was assessed in this study were inadequate for complete comprehension by this distinct group of participants (Leff et al., 2006).

HAB and anxiety.

Maladaptive attributions of intent have also been independently linked to anxiety. Instead of being characterized as "hostile" attributions, however, they are described as "defeated" (Fan, Wu, Liu, & Chen, 2007), "threatening" (Miers, Blöte, Bögels, & Westenberg, 2008), or generally "negative" (Chambless, Blake, & Simmons, 2010; Taylor & Wald, 2003). That being said, this tendency to negatively interpret an ambiguous provocation seems to be a feature of anxious individuals as well as aggressive ones (e.g., Wilson & Rapee, 2005). Reid et al. (2006) conducted one of the few studies to specifically examine "hostile" attributions and anxiety in a sample of children (age 8-14 years). They found that hostile attributions comprised a part of a general "negativity bias" that was pervasive across cognitive modalities (i.e., affecting attention, attributions, judgment, and memory) and significantly linked to anxiety, depression, and aggression. They argued that more detailed measures were needed to potentially distinguish specific cognitive differences between anxious, depressed, and aggressive children.

The most notable study of the research relating HAB to anxiety is by Miers et al. (2008). In a non-clinical sample of adolescents, they conducted a much more in-depth assessment of the attribution process. Instead of simply asking individuals to say whether or not a provocation was "trying to be mean or not trying to be mean," they presented participants with multiple thought options and asked them to rate each one on how likely they would be to think it. Following the thoughts, participants were asked to pick the one they believed most. Miers et al. found that socially anxious participants were significantly more likely to make negative attributions than controls, but not significantly different in terms of the positive attributions. Similarly, socially anxious individuals were significantly more likely to believe negative thoughts than controls. They argue that anxiety treatments should focus more on reducing negative interpretations (versus trying to increase "positive thinking").

The Miers et al. (2008) study is particularly interesting when deciding how to proceed with research on HAB as it relates to both anxiety and aggression. Their methodology and results suggest a much richer picture of this cognitive bias when compared to previous research, adding insight to the specific cognitive processes happening when such attributions are made. Given these results, it follows that moving forward with research on HAB in aggression and anxiety requires further detail and specification. One such area that has yet to be explored in depth is the role of the provocateur in HAB.

The Role of Provocateur Motivation

It should be noted that up to this point, the focus has solely been on the individual with HAB. While it is clear that there are unique facets of HAB within the individual (i.e., degrees of specificity to aggression and anxiety), little is known about specific cognitions involved in this bias. If effective interventions for individuals with anxiety, aggression, and comorbid conditions

are to be gleaned from research on this construct, much more detail about the actual thoughts experienced by an individual in the provocative situations need to be sought. One potential starting point for finding these specifics involves consideration of the fact that there are two people involved where HAB is concerned: the individual with HAB *and the provocateur*. Focusing solely on the person with HAB is only half the story. Now, then, it appears necessary to consider the effects of provocateurs and their relationship to individuals' attributions of intent.

Provocateur motivation and aggression.

While the majority of HAB research focuses on the hostile individuals' demographic features, some studies have looked at the importance of provocateur features in influencing aggressive responding. Juujärvi, Kooistra, Kaartinen, and Pulkkinen (2001) found that physical characteristics of a provocateur (e.g., height, weight, gender) were strongly related to the amount of retaliatory aggression selected in a computer task. Specifically, they found that both boys and girls responded most aggressively to a peer of the same gender and close to the same size as them, and were less aggressive to opposite gender peers that were either smaller or larger than them. So it does seem that, even at the most basic physical level, characteristics of the provocateur have an effect on an individual's aggression.

Ray and Cohen (1997) and Ray, Norman, Sadowski, and Cohen (1999), instead of looking at provocateurs' exterior features, investigated the importance of the underlying relationship between provocateur and victim (i.e., best friend, acquaintance, or enemy) with regards to HAB and aggression. Both studies found that children evaluated confrontations between provocateurs labeled as 'acquaintances' or 'enemies' much more negatively than they did for situations with those labeled as 'friends.' More recently, Peets, Hodges, Kikas, and Salmivalli (2007) conducted a similar study using children's real life self-reported friends,

acquaintances, and enemies. Their results were similar, suggesting that children do differentiate between relationship types with regards to HAB and responsive aggression. These results may be further explained by studies examining the effects of individual's HAB on their evaluation of a provocateur's character and moral standing.

Research has shown that different interpretations of conflict situations (i.e., hostile or benign) yield different judgments about the provocateur as a person and, as a result, different responses. For example, Freeman, Hadwin, and Halligan (2011) found that peer interpretation of an event (either endorsing hostile or benign intentions) significantly affected whether or not participants (mean age 13.8 years) made hostile attributions. Furthermore, research has demonstrated that additional information about both the provocateur and the conflict situation can alter even a hostile individual's interpretation. Kremer and Stephens (1983) found that providing mitigating information (i.e., information excusing the provocateur's behavior) immediately after an aggressive act led to decreases in retaliatory aggression. Providing this information later or subjecting participants to a second attack, however, decreased or eliminated the buffering effect of the mitigation. In a similar study, this one with mitigating information present prior to provocation, Pederson (2006) found that individuals who had a positive view of a provocateur were much more likely to attribute an aggressive act to external circumstances (i.e., as inconsistent with that person's normal behavior) and would subsequently inhibit an aggressive response. However, for a provocateur whom participants had no positive feelings for (i.e., the 'neutral' condition), they were much more likely to attribute an aggressive act to internal characteristics (i.e., not 'inconsistent' behavior) and respond with aggression. This explanation may account for the changes in hostility and aggression as a result of relationship type in studies of provocateur status and HAB. For example, Peets et al. (2007) found that children displayed

different responses (i.e., hostile or forgiving) depending on the status (friend, enemy, or neutral) of the provocateur. The next major step is to examine the specific moral evaluations made and, perhaps more importantly, the information that most affects these responses.

In an effort to find a specific situational factor that may lead to the harsher moral evaluations of provocateurs, Reeder, Kumar, Hesson-McInnis, and Trafimow (2002) conducted a study on interpretations based on information regarding the specific *motivation* behind an aggressive act. Specifically, they sought to examine whether or not knowing that an aggressive act was proactively or reactively motivated would impact participants' moral evaluations of the provocateur. They found that, when an act was proactively motivated (i.e., when the provocateur was receiving a secondary gain such as money for aggressing), participants evaluated provocateurs much more harshly than for situations where the aggression was not motivated by external gain. Similarly, Leahy (1979) found that presenting children with different information about motivation influenced the severity of punishment given to hypothetical provocateurs. Specifically, he found that for situations involving mitigation (i.e., response to provocation from the participant) or duress (i.e., being told by a bully that they have to do something), provocateurs were seen as less responsible for their actions and lighter punishments were given. However, in situations where indicators of internal 'maladjustment' (i.e., being described as "a little crazy" or being known to get into fights a lot) were presented, Leahy found that children were much more likely to hold the provocateur accountable for the action and select a more severe punishment.

Based on this body of research, it seems clear that different information about the provocateur can change an individual's evaluation of them, but there is still the question of just what that evaluation entails, especially in the case of a hostile one. The literature has

demonstrated that particular judgments are made about provocateurs when participants are given information, but no one has systematically assessed how these individuals interpret these situations (and come to unique moral evaluations) on their own. Specifically, current research has yet to answer the question of suspected provocateur motive: "Do you think the provocateur victimized you for a particular reason?" While it is true that variations of the vignettes have questions asking about provocateur motivation, there does not appear to be any published literature that utilizes this information yet. As it has been demonstrated that certain types of information and interpretations dampen hostile responses (Kremer & Stephens, 1983, Reeder et al., 2002) clarifying these findings from a first-person perspective has the potential to seriously change HAB focused intervention strategies.

Provocateur motivation and anxiety.

Although there is very little research relating perceived provocateur motivation and anxiety, a few interesting studies do stand out. Prinstein et al. (2005) found that, in addition to hostile attributions, critical self-referent attributions significantly impacted the presence of internalizing symptoms over time. Simply put, following negative experiences, children who had the tendency to blame themselves for the outcome were much more likely to show anxiety and depression later in life. This finding can be paralleled in part to those of Reeder et al., (2002), who found a decrease in aggression in response to a reactively motivated action. Following that line of thinking, if a child attributes a peer's actions as being mean *in response to him* (i.e., reactive), it follows to reason that the child will not become aggressive. Further, and in line with Prinstein et al.'s results, a child attributing negative experiences to himself is more likely to experience significant internalizing problems.

In the 2011 Freeman et al. study described previously, a major finding was that socially anxious individuals were significantly less likely to make hostile attributions, even in the presence of a hostility-endorsing peer. They argued that participants may have viewed the hostility-endorsing peer as a threat or, more likely, concerns about their own image may have superseded their desire to conform to their peer. Based on the example hostility endorsements presented in the article, however, this study seemed to assert proactive motivations for the ambiguous actions (e.g., "to show dat this is their territory and to make me feel small"). It is entirely possible that the socially anxious children did not conform to peer endorsements because they truly did not believe the provocateurs in each situation were proactively motivated.

Considering the limited research focusing on provocateur motivation in both anxious and aggressive individuals, there is a strong possibility that this variable may distinguish associations between HAB and aggression, and HAB and anxiety. Given the convoluted nature of the overlap/divergence between internalizing and externalizing symptoms, as well as the array of unique behavioral profiles assorted with either (or both), logic follows that there must be some distinct mechanism by which individuals can be differentiated from one another. Perceived provocateur motivation may be that mechanism.

Statement of the Problem

Although primarily considered in isolation from one another, internalizing and externalizing problems are considerably comorbid (Costello et al., 2004). Given the wide variety of cognitive, emotional, and behavioral symptoms associated with both anxiety and aggression, it is safe to say that an individual experiencing both issues simultaneously presents a significantly different case than one experiencing either in isolation (Marsee et al, 2008). As such, it is necessary to better understand the patterns of overlap between anxiety and aggression so that

more personalized and effective treatments can be designed. Current literature suggests that anxiety differentially relates to specific iterations of aggressive behavior such that comorbidity is more likely for only select forms, functions, and subtypes of aggression. Specifically, anxiety is strongly associated with relational aggression (e.g., Gros et al., 2010), reactive aggression (e.g., Vitaro et al., 2002), and reactive relational aggression (Marsee et al., 2008). That being said, to date no research has assessed for these unique patterns all at once. The first goal of this study is to check the differential associations between anxiety and the forms (relational/overt), functions (reactive/proactive), and subtypes (proactive overt/reactive overt/proactive relational/and reactive relational) of aggression.

In terms of a potential explanation for this unique pattern of selective comorbidity between anxiety and aggression, HAB is a very strong contender. Research consistently demonstrates unique associations between HAB and aggression (Orobio de Castro et al., 2002), as well as anxiety (e.g., Miers et al., 2008). Even more important, however, is that studies focusing on the more specific forms, functions and subtypes of aggression suggest that HAB show differential relations to certain specific types in a pattern akin to anxiety's relationships to aggression (i.e., relational aggression: Crick, 1995; reactive aggression: Dodge & Coie, 1987; reactive relational aggression: Bailey & Ostrov, 2008). When taken together, the current literature makes a compelling case for HAB as a potential mediating mechanism to explain the unique patterns of comorbidity between anxiety and aggression. Similar to research linking anxiety to the various types of aggression, however, research exploring the unique occurrence of HAB in the forms/functions/subtypes of aggression and comorbid aggression and anxiety is also extremely limited. Further, studies looking at comorbid anxiety and aggression tend to only conceptualize HAB as an associated correlate, not a mechanism by which this

internalizing/externalizing comorbidity is facilitated (i.e., mediation). The second goal of this study is to examine the role of HAB in aggression, anxiety, and comorbidity.

Given the differential patterns of apparent overlap and divergence between anxiety and the types of aggression, as well as the differentiating role of HAB implied by previous research, it follows to reason that there could be a more specific cognitive bias within HAB that distinguished these groups (aggressive, anxious, and comorbid) from one another. This paper proposes that one possible defining thought is the individual's interpretation of the provocateur's specific motive (reactive vs. proactive). Research involving provocateur motive suggests differential associations between reactive and proactive motives across both aggression and anxiety. More specifically, current studies demonstrate evidence for proactive/reactive motive differences in influencing 1) an individual's appraisal of a negative situation (Freeman et al., 2011), 2) the likelihood of a person responding with aggression (Reeder et al., 2002), and 3) the presence of anxiety symptoms (Prinstein et al., 2005). Studies examining provocateur motive in both aggression and anxiety or, more significantly, studies linking proactive/reactive motive to HAB specifically, however, are exceedingly rare or even nonexistent. The final goal of the present study is to assess the role of perceived proactive vs. reactive provocateur motivation in HAB as it relates to the types of aggression, anxiety, and their comorbidity.

Based on these stated goals, hypotheses are as follows:

1. Anxiety will show unique associations with relational aggression, reactive aggression, reactive relational aggression, and reactive overt aggression. Overt aggression, proactive aggression, proactive overt aggression, and proactive relational aggression will not be significantly related to anxiety.

2. HAB will be significantly associated with anxiety, total aggression, reactive aggression, reactive relational aggression, and reactive overt aggression.
3. HAB will mediate the association between aggression and anxiety.
4. Provocateur motivation will distinguish between aggressive, anxious, and comorbid individuals such that proactive provocateur motivation will be uniquely associated with aggression, reactive provocateur motivation will be uniquely associated with anxiety, and a combination of both motivations will be related to comorbidity.

Method

Participants

A sample of youth (N = 96 mean age = 13.84 years; SD = 1.94, 51% male, 37.5% white) were recruited from the community in and around New Orleans, LA as part of a larger study examining youth's physiology, behaviors, and emotions. Recruitment was carried out through in-class announcements at the University of New Orleans, postings on Craigslist, and distribution of flyers in local intermediate and secondary schools. Participants were selected for inclusion on the basis of parental consent/youth assent and availability to fill out questionnaires and no participants were excluded from the present study.

Measures

Demographics.

Participants provided their month and year of birth, age, ethnicity, gender, grade, and GPA.

Aggression.

Children's type of aggression was assessed using the Peer Conflict Scale (PCS, Marsee & Frick, 2007). The PCS is a 40-item self-report measure that assesses the presence of the four subtypes of aggression: proactive overt (e.g., "I start fights to get what I want"), reactive overt (e.g., "When someone hurts me, I end up getting into a fight"), proactive relational (e.g., "I gossip about others to become popular"), and reactive relational (e.g., "If others make me mad, I tell their secrets") in youth. Participants circle a number based on how well the statement describes him/her (0= "not at all true," 1= "somewhat true," 2= "very true," and 3 = "definitely true"). Subtype scores are calculated by summing the 10 items that compose each subscale and range from 0 – 30. Proactive and Reactive function scores are calculated by summing the 20 items for each subscale and range from 0-60. Overall aggression scores are the sum of all of the PCS items and range from 0-120. Marsee and Frick (2007) demonstrated good internal consistency (measured by Cronbach's α) for the subtype scores in a sample of detained girls (reactive overt = .87, proactive overt = .82, reactive relational = .80, proactive relational = .76). Additionally, Marsee (2008) demonstrated reliability for the reactive and proactive scales in a sample of adolescents affected by hurricane Katrina (total reactive α = .87, total proactive α = .86). For this study, each of these scales demonstrated acceptable to good internal consistency reliability (alphas ranged from .75 to .92 see Table 1).

Anxiety.

Anxiety was assessed using the Revised Child Anxiety and Depression Scale (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000; Spence, 1997) The RCADS is a 47-item measure that assesses symptoms of each anxiety disorder excluding PTSD and specific phobia (i.e., panic disorder, social phobia, separation anxiety, generalized anxiety, and obsessive-compulsive disorder) and major depression based on DSM-IV criteria (APA, 1994). Children

respond to items (e.g., “I worry about things”) based on a scale of 1 = “Never” to 4 = “Always.” For this study, the Total Anxiety Score will be used (sum of all five anxiety scales, 37 items).The RCADS has demonstrated a factor structure consistent with the DSM-IV anxiety disorders and depression, as well as convergent validity with existing measures of childhood anxiety and depression (Chorpita et al., 2000). In a sample of 203 youth aged 6-17 years, Scott and Weems (2010) found excellent reliability for the total anxiety scale (α =.94). Excellent reliability was also found for the total anxiety scale in this study (α =.93).

HAB and provocateur motivation.

HAB and provocateur motivation were measured using a set of animated/narrated vignettes based on a modified version of the Crick (1995) HAB vignettes. Each story involves a situation with a negative outcome (e.g., having milk spilled on your back, not being invited to a party) where the intent of the provocateur is ambiguous. The stories consist of five relational (e.g., seeing two peers whispering and looking at you in the hallway) and five overt (e.g., being bumped from behind and falling into a mud puddle) provocation situations. These stories have demonstrated good reliability for both relational (α = .65-.78) and overt (α = .77-.86) situations (Crick et al., 2002), as well as predictive utility for both the forms (Crick, 1995; Crick et al., 2002) and functions (Crick & Dodge, 1996) of aggression.

In the original stories the provocateur is always described as a ‘kid’ but five of the vignettes used in this study (two overt and three relational situations) have been modified to be gender specific, two stories involve mixed gender groups (both relational situations), and three (overt situation) stories were kept the same, leaving the gender of the provocateur ambiguous. Additionally, the content of two of the stories was altered to increase salience for the age range being studied. For example, an original vignette involves bringing a radio to school to show

other kids. In the modified vignette, the story contains a cellular phone instead of a radio. Another modified story involves seeing a friend receive a text message from someone unknown instead of the original version, which involved seeing a friend playing with someone unknown. Additionally, animation and narration components were added to the vignettes in order to better illustrate the ambiguity of each provocation situation, as well as control for participants' reading levels. Previous work using this version of the vignettes found them to be comparable to the written-only version (Kunimatsu, Marsee, Lau, & Fassnacht, 2012).

After each story youth are asked to answer two follow-up questions. In the original version, the first question asks why the even happened and contains four options (two benign, two hostile), and the second question asks whether or not the kid in the story was trying to be mean. In order to evaluate some of the specific hypotheses of this study, several changes to these follow up questions were also made. In the modified vignettes, the first question is now an assessment of overall HAB, and asks whether or not the child thinks the provocateur in the story was trying to be mean (1 = yes and 2 = no). Scores for this scale range from 0-10 (10 items). The two follow-up questions, designed to assess perceived provocateur motivations, ask participants how likely they are to think that the events in the story happened for particular reasons ranging from 0 = "not at all likely" to 4 = "very likely". Question two offers a proactive motivation (e.g., "How likely are you to think that this happened because the kid wants a better grade than you?"). Question three offers a reactive motivation (e.g., "How likely are you to think that this happened because the kid was trying to get back at you for something?"). Summing the items for each question (10 items per scale) will create proactive and reactive motivation scores ranging from 0-40. In a sample of high school students, Kunimatsu et al. (2012) found the items on this version of the vignettes to demonstrate good to fair internal consistency reliability for each scale (general

HAB α = .56, proactive motive suspicion α = .85, and reactive motive suspicion α = .85). Similar reliability scores were found for the current study (general HAB α = .52, proactive motive suspicion α = .82, and reactive motive suspicion α = .78).

Procedure

All data collection occurred at a lab located in the Geology/Psychology building on the lakefront campus of the University of New Orleans. Following attainment of parental consent and youth assent, participants were taken to a separate room where they viewed the animated vignettes. Following each animation, a trained graduate student read each of the follow-up questions to the participant and recorded the answers. Once the HAB task was completed, participants were escorted to another room where they completed a questionnaire packet with a trained undergraduate research assistant. Upon completion of the questionnaire packet, parents and youth were given a debriefing form, asked if they had any questions, and compensated with $50 ($20 for the youth, $30 for the parent) for their time.

Results

Preliminary Analyses

Descriptive statistics for the main study variables are presented in Table 1. Overall, participants reported higher levels of overt aggression than relational aggression ($t = 7.51$ *(95)*, $p < .001$), higher levels of reactive aggression than proactive aggression ($t = 6.66$*(95)*, $p < .001$), and higher levels of reactive overt aggression than any other subtype (reactive relational aggression, $t = 7.86$*(95)*, $p < .001$; proactive relational aggression, $t = 6.31$*(95)*, $p < .001$; proactive overt aggression, $t = 6.03$*(95)*, $p < .001$). Participants reported higher suspicion of proactive motivations than of reactive motivations ($t = 17.77$, *(95)*, $p < .001$).

Table 1 - Descriptives of Study Variables

Variable	Min.	Max.	Mean	SD	Alpha
1. Age	11	17	13.84	1.94	--
2. Ethnicity	--	--	37.5% white	--	--
3. Gender	--	--	51% male	--	--
4. HAB	0	7	3.71	2.02	.52
5. Proactive Motive Suspicion	1	38	14.20	7.95	.82
6. Reactive Motive Suspicion	0	32	12.14	7.06	.78
7. Total Aggression	0	70	10.87	12.17	.92
8. Relational Aggression	0	37	4.67	6.09	.90
9. Overt Aggression	0	33	6.20	7.03	.88
10. Proactive Aggression	0	30	3.58	5.27	.86
11. Reactive Aggression	0	40	7.28	7.42	.88
12. Proactive Overt Aggression	0	13	1.66	2.70	.75
13. Proactive Relational Aggression	0	18	1.92	2.98	.83
14. Reactive Overt Aggression	0	21	4.54	4.85	.84
15. Reactive Relational Aggression	0	19	2.74	3.41	.81
16. Anxiety	1	81	25.18	15.69	.93

Note. HAB = hostile attributional bias; Gender was coded 0 for male and 1 for female. Ethnicity was coded 0 for white and 1 for nonwhite.

Pearson correlations of the main study variables are presented in Table 2a. As expected, all four subtypes of aggression were significantly positively correlated with each other, with r's ranging from .60 (reactive relational and reactive overt, $p < .01$) to .79 (reactive relational and proactive relational, $p < .01$). Gender (1 = male, 2 = female) was significantly correlated overt aggression ($r = -.23$, $p < .05$) and reactive overt aggression ($r = -.24$, $p < .05$), with boys reporting more. Ethnicity was significantly correlated with HAB ($r = .26$, $p < .01$) and proactive motive suspicion ($r = .28$, $p < .01$), with caucasian participants reporting less of each. Anxiety was significantly correlated with all of the types of aggression with r's ranging from .22 (reactive overt aggression, $p < .05$) to .32 (reactive relational aggression, $p < .01$). HAB was significantly correlated at the .05 level with proactive overt aggression, but was not significantly related to any other type of aggression or anxiety. Proactive motive suspicion was significantly correlated with total aggression ($r = .25$, $p < .05$), relational aggression ($r = .27$, $p < .01$), reactive aggression ($r = .24$, $p < .05$), proactive aggression ($r = .22$, $p < .05$), reactive relational aggression ($r = .29$, $p < .01$), HAB ($r = .39$, $p < .01$), and anxiety ($r = .37$, $p < .01$). Reactive motive suspicion was correlated with proactive motive suspicion ($r = .70$, $p < .01$), as well as with relational aggression ($r = .20$, $p < .05$), reactive relational aggression ($r = .22$, $p < .05$), anxiety ($r = .21$, $p < .05$), and HAB ($r = .34$, $p < .01$).

To control for the strong negative skew in the aggression variables, Spearman correlations were also conducted (see Table 2b). Results did not substantially differ from the Pearson correlations.

Table 2a – Pearson Correlations of Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age															
2. Ethnicity	.02														
3. Gender	-.09	.11													
4. Proactive Overt Aggression	.21*	-.03	-.18												
5. Proactive Relational Aggression	.13	.06	-.04	.72**											
6. Reactive Overt Aggression	.18	.03	-.24*	.71**	.60**										
7. Reactive Relational Aggression	.08	.14	-.04	.68**	.80**	.60**									
8. Reactive Aggression	.15	.08	-.18	.78**	.76**	.93**	.85**								
9. Proactive Aggression	.18	.02	-.11	.92**	.94**	.71**	.80**	83**							
10. Overt Aggression	.20	.01	-.23*	.87**	.70**	.96**	.67**	.94**	.84**						
11. Relational Aggression	.11	.11	-.04	.74**	.94**	.63**	.96**	.86**	.91**	.72**					
12. Total Aggression	.17	.06	-.16	.87**	.87**	.87**	.87**	.97**	.94**	.94**	.92**				
13. Anxiety	.05	.06	.14	.25*	.23*	.22*	.32**	.29**	.26*	.24*	.29**	.29**			
14. HAB	-.17	.26**	-.06	.13	.23*	.14	.16	.16	.20	.15	.21*	.19	.11		
15. Proactive Motive Suspicion	-.13	.28**	.03	.19	.22*	.17	.29**	.24*	.22*	.19	.27**	.25*	.37**	.39**	
16. Reactive Motive Suspicion	-.17	.18	-.10	.13	.16	.09	.22*	.16	.16	.12	.20*	.17	.21*	.34**	.71**

Note. N = 96. HAB = hostile attributional bias; Gender was coded 1 for male and 2 for female. Ethnicity was coded 0 for white and 1 for nonwhite.
*$p < .05$, ** $p < .01$

Table 2b – Spearman Correlations of Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age															
2. Ethnicity	.02														
3. Gender	-.09	.11													
4. Proactive Overt Aggression	.11	.07	-.20*												
5. Proactive Relational Aggression	.13	.09	-.12	.65**											
6. Reactive Overt Aggression	.14	.10	-.19	.57**	.56**										
7. Reactive Relational Aggression	.14	.16	-.02	.52**	.65**	.51**									
8. Reactive Aggression	.15	.14	-.14	.62**	.69**	.91**	.80**								
9. Proactive Aggression	.13	.10	-.20	.88**	.92**	.62**	.65**	.73**							
10. Overt Aggression	.15	.11	-.19	.76**	.65**	.96**	.56**	.91**	.77**						
11. Relational Aggression	.15	.16	-.07	.63**	.86**	.60**	.94**	.83**	.83**	.67**					
12. Total Aggression	.15	.15	-.16	.76**	.81**	.87**	.80**	.97**	.87**	.92**	.89**				
13. Anxiety	.07	.04	.12	.36**	.27**	.25*	.27***	.32**	.34**	.32**	.29**	.36**			
14. HAB	-.16	.27**	-.02	.10	.16	.08	.06	.10	.14	.09	.10	.12	.12		
15. Proactive Motive Suspicion	-.15	.27**	-.02	.28**	.23*	.09	.21*	.17	.25*	.12	.23*	.20*	.34**	.41**	
16. Reactive Motive Suspicion	-.16	..18	-.17	.25*	.21*	.12	.18	.16	.21*	.15	.18	.18	.18	.32**	68**

Note. N = 96. HAB = hostile attributional bias; Gender was coded 1 for male and 2 for female. Ethnicity was coded 0 for white and 1 for nonwhite.
*$p < .05$, ** $p < .01$

Hypothesis 1

Hypothesis 1 stated that anxiety would show unique associations with relational aggression, reactive aggression, and reactive relational aggression. To test this hypothesis, a series of multiple regression analyses were conducted to determine the association between these specific types of aggression and anxiety (see Table 3). Each regression contained the target aggression type (i.e., relational aggression, reactive aggression, or reactive relational aggression) and controlled for their complementary types (i.e., overt aggression, proactive aggression, and reactive overt aggression and proactive relational aggression, respectively).

Results, presented in Table 3, were partially consistent with Hypothesis 1 in that reactive relational aggression was significantly associated with anxiety when controlling for reactive overt aggression ($\beta = .295$, $p < .05$) and when controlling for proactive relational aggression ($\beta = .368$, $p < .05$). Both relational and reactive aggression, however, were not significantly associated with anxiety when overt aggression and proactive aggression (respectively) were accounted for (relational aggression $\beta = .248$, $p = .09$ and reactive aggression $\beta = .233$, $p = .19$). Additional analyses were conducted to test for a significant contribution by gender and potential gender-by-aggression type interactions, but results were nonsignificant.

Table 3 - Hierarchical Regressions for Aggression Types Predicting Anxiety

		Model R^2	β	*t*	*p*
Model Predicting Anxiety					
Step 1	Relational Aggression	.087**	**.294**	2.985	.004
Step2	Relational Aggression	.089	.248	1.733	.086
	Overt Aggression		.065	.454	.651
Step 1	Reactive Aggression	.082**	**.287**	2.906	.005
Step2	Reactive Aggression	.084	.233	1.312	.193
	Proactive Aggression		.065	.367	.715
Step 1	Reactive Relational Aggression	.101**	**.318**	3.252	.002
Step2	Reactive Relational Aggression	.102	**.295**	2.409	.018
	Reactive Overt Aggression		.038	.313	.755
Step 1	Reactive Relational Aggression	.101**	**.318**	3.252	.002
Step2	Reactive Relational Aggression	.103	**.368**	2.252	.027
	Proactive Relational Aggression		-.063	-.383	.703

Note. N = 96. Significant betas are in bold. *$p < .05$, ** $p < .01$

Given the highly correlated nature of the forms, functions, and subtypes of aggression (see Table 2), a series of correlation matrix models were conducted in AMOS. The models (see Figures 1, 2, and 3) consisted of anxiety covarying with overt and relational aggression, proactive and reactive aggression, and the four subtypes of aggression, respectively. To test for differences in bivariate associations (i.e., if the correlation value for one association is significantly different from another), covariance paths were constrained to be equal and general least squares analyses were conducted. Results indicated no significant differences in any bivariate association (relational/overt $\chi^2 = .03$, $p = .87$, proactive/reactive $\chi^2 = 3.02$, $p = .08$, reactive overt/reactive relational $\chi^2 = .01$, $p = .91$, proactive relational/reactive relational $\chi^2 = 3.36$, $p = .07$).

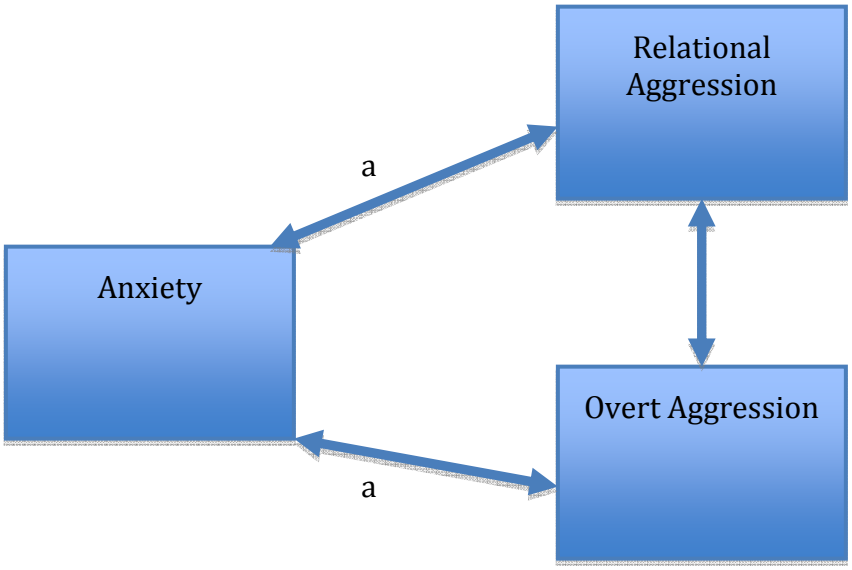

Figure 1. Model of Correlations between Anxiety and the Relational/Overt Forms of Aggression. a = equality constraint. Model $\chi^2 = .026$, $p = .87$.

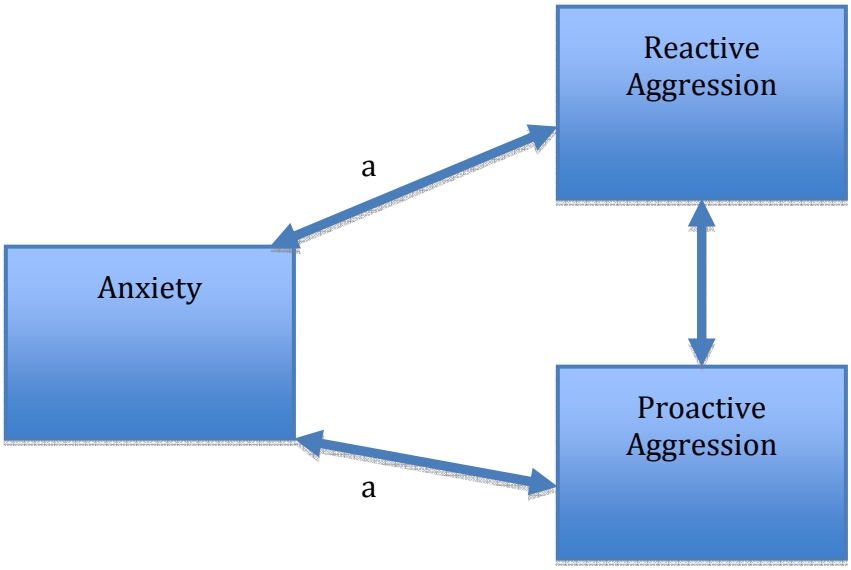

Figure 2. Model of Correlations between Anxiety and the Reactive/Proactive Functions of Aggression .a = equality constraint. Model $\chi^2 = 3.02$, $p = .08$.

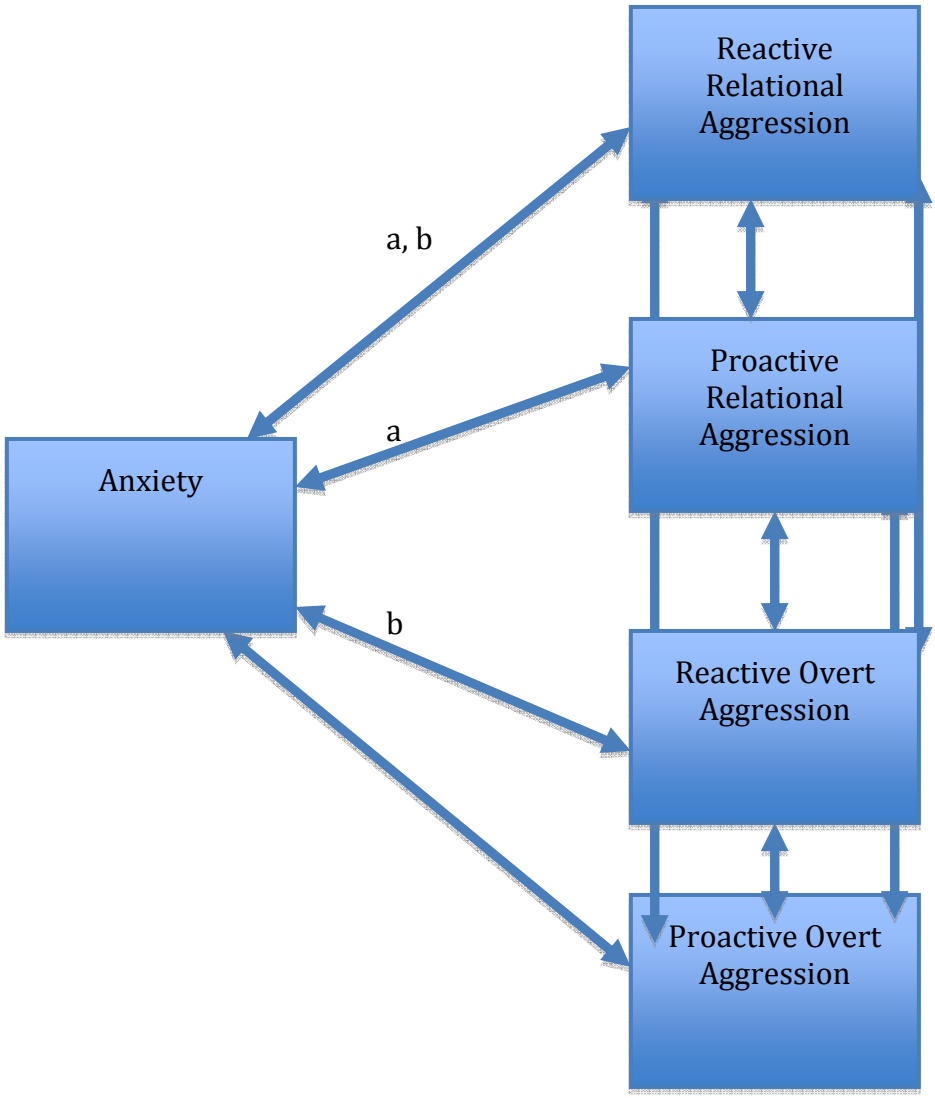

Figure 3. Model of Correlations between Anxiety and the Subtypes of Aggression of Aggression. a, b = equality constraints (each a separate model). Reactive Overt/Reactive Relational Model: $\chi^2 = .01$, $p = .91$, Proactive Relational/Reactive Relational Model: $\chi^2 = 3.36$, $p = .07$.

Hypothesis 2

Hypothesis 2 stated that HAB would be significantly associated with anxiety, total aggression, reactive aggression, reactive relational aggression, and reactive overt aggression. To test this hypothesis, a series of regressions similar to those used in Hypothesis 1 were used (see Table 4). Predictors were anxiety and total aggression, reactive aggression controlling for proactive aggression, reactive relational aggression controlling for reactive overt aggression and proactive relational aggression, and reactive overt aggression controlling for proactive overt aggression, and reactive relational aggression.

Results did not support Hypothesis 2. None of the predictors were significantly related to HAB even when not controlling for other variables (i.e., when entered into the regression as a single predictor: anxiety $\beta = .186$, $p = .07$, aggression $\beta = .109$, $p = .29$, reactive aggression $\beta = .164$, $p = .11$, reactive relational aggression $\beta = .162$, $p = .12$, and reactive overt aggression $\beta = .137$, $p = .18$). Supplemental analyses indicated that ethnicity was significantly associated with HAB (see Tables 2a and 2b), but no significant ethnicity-by-aggression or ethnicity-by-anxiety interactions were found.

Table 4 - Hierarchical Regressions for Anxiety and Aggression Types Anxiety Predicting HAB

		Model R^2	β	*t*	*p*
Model Predicting Anxiety					
Step 1	Total Aggression	.035	.186	1.836	.069
Step2	Total Aggression	.038	.169	1.587	.116
	Anxiety		.061	.573	.568
Step 1	Anxiety	.012	.109	1.067	.289
Step2	Anxiety	.038	.061	.573	.568
	Total Aggression		.169	1.587	.116
Step 1	Reactive Aggression	.027	.164	1.616	.109
Step2	Reactive Aggression	.039	-.001	-.006	.996
	Proactive Aggression		.199	1.097	.275
Step 1	Reactive Relational Aggression	.026	.162	1.590	.115
Step2	Reactive Relational Aggression	.029	.124	.975	.332
	Reactive Overt Aggression		.063	.495	.622
Step 1	Reactive Relational Aggression	.026	.162	1.590	.115
Step2	Reactive Relational Aggression	.056	-.067	-.397	.692
	Proactive Relational Aggression		.286	1.706	.091
Step 1	Reactive Overt Aggression	.019	.137	1.343	.183
Step2	Reactive Overt Aggression	.029	.063	.495	.622
	Reactive Relational Aggression		.124	.975	.332
Step 1	Reactive Overt Aggression	.019	.137	1.343	.183
Step2	Reactive Overt Aggression	.021	.090	.615	.540
	Proactive Overt Aggression		.067	.461	.646

Note. N = 96. HAB = hostile attributional bias.

As with Hypothesis 1, a series of correlation matrix models were conducted in AMOS. The models (see Figures 4, 5, and 6) consisted of HAB covarying with aggression and anxiety, proactive and reactive aggression, and the four subtypes of aggression, respectively. Covariance paths were constrained to be equal and general least squares analyses were conducted. Results indicated no significant differences in any bivariate association (anxiety/aggression $\chi^2 = .10$, $p = .75$, proactive/reactive $\chi^2 = .16$, $p = .69$, reactive overt/reactive relational $\chi^2 = .15$, $p = .16$, proactive relational/reactive relational $\chi^2 = .44$, $p = .51$, and proactive overt/reactive overt $\chi^2 = .75$, $p = .39$).

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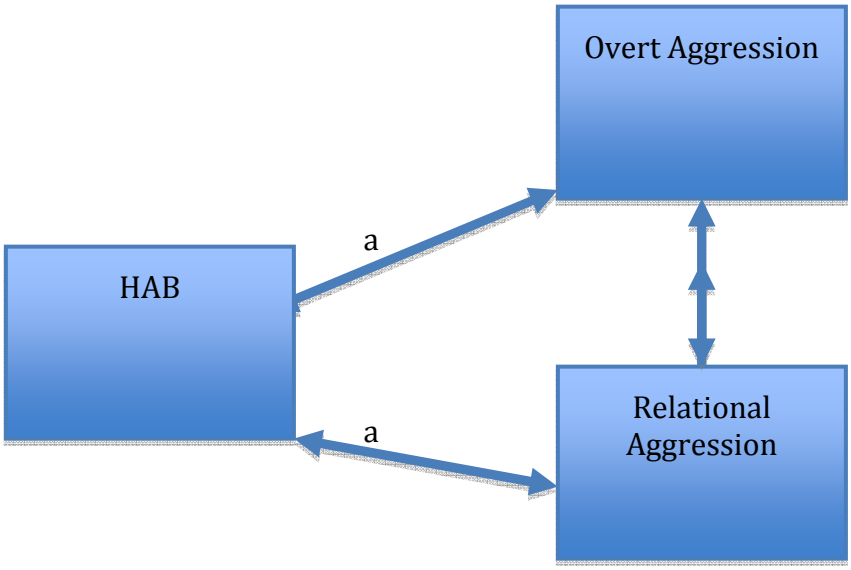

Figure 4. Model of Correlations between HAB and the Overt/Relational Forms of Aggression. HAB = Hostile Attributional Bias. a = equality constraint. Model $\chi^2 = .16$, $p = .69$.

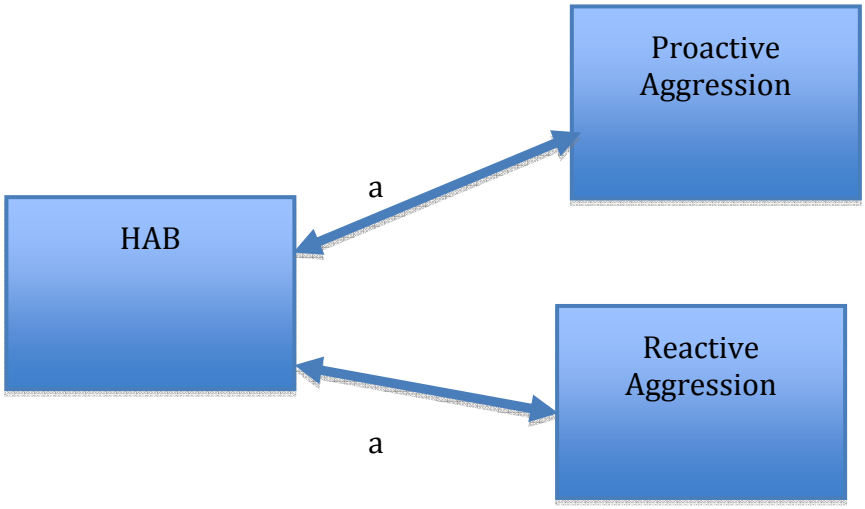

Figure 5. Model of Correlations between HAB and the Reactive/Proactive Functions of Aggression .HAB = Hostile Attributional Bias. a = equality constraint. Model $\chi^2 = .16$, $p = .69$.

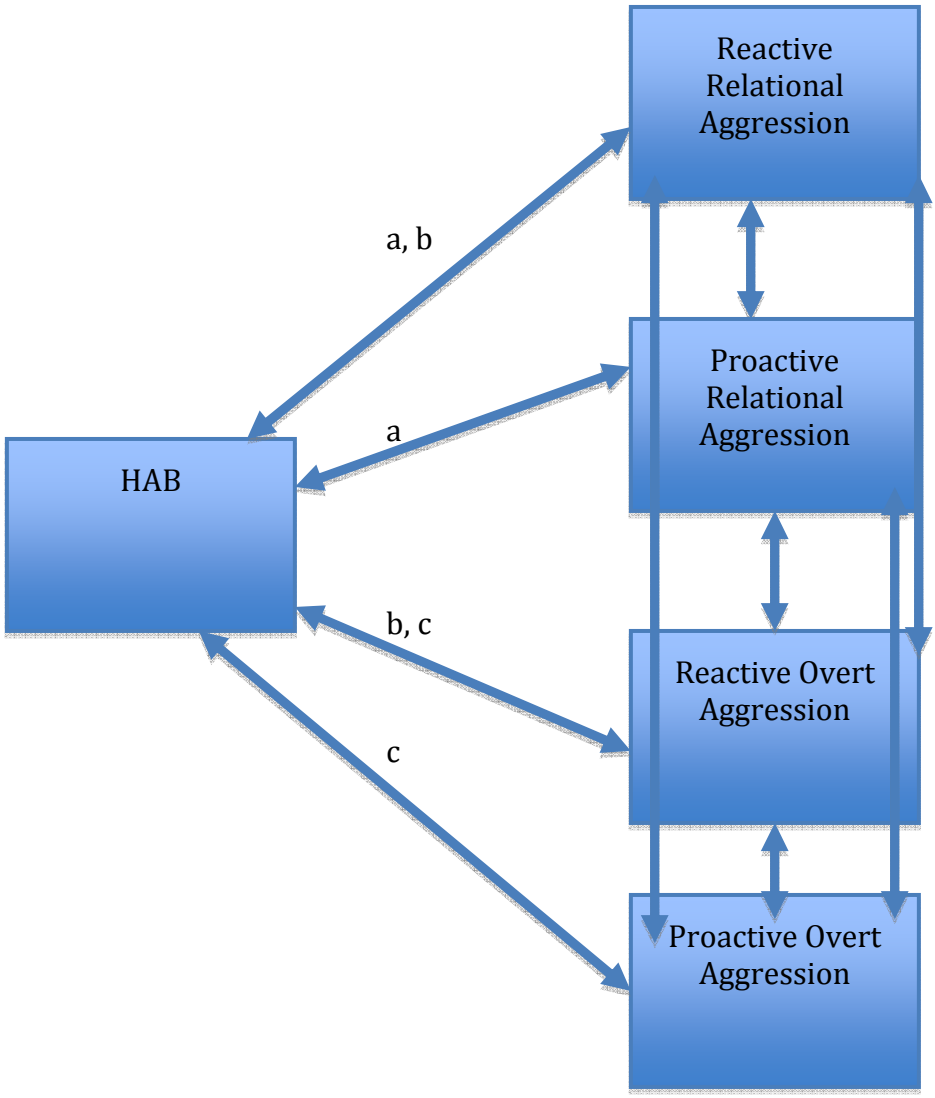

Figure 6. Model of Correlations between HAB and the Subtypes of Aggression of Aggression. HAB = Hostile Attributional Bias. a, b, c = equality constraints (each a separate model). Reactive Overt/Reactive Relational Model: $\chi^2 = .15$, $p = .16$, Proactive Relational/Reactive Relational Model: $\chi^2 = .44$, $p = .51$, Proactive Overt/Reactive Overt Model: $\chi^2 = .75$, $p = .39$.

Hypothesis 3

Hypothesis 3 stated that HAB would mediate the association between aggression and anxiety. To test this hypothesis, a series of regression analyses (see Table 5) were conducted as suggested by Baron and Kenny's (1968) conditions for mediation. The first condition—that anxiety is significantly related to aggression—was met ($\beta = .288$, $p < .01$). Findings for HAB relating to each variable, however, were not significant (with anxiety $\beta = .109$, $p = .29$ and with aggression $\beta = .186$, $p = .07$) so no further analyses were conducted.

Table 5 – Testing for HAB Mediation between Aggression and Anxiety

		Model R^2	β	*t*	*p*
Anxiety Predicting Aggression					
		.083**	**.288**	2.916	.004
Anxiety Predicting HAB					
		.012	.109	1.067	.289
HAB Predicting Aggression					
		.035	.186	1.836	.069
Anxiety and HAB Predicting Aggression					
Step 1	Anxiety	.083**	**.288**	2.916	.004
Step2	Anxiety	.107	**.271**	2.748	.007
	HAB		.156	1.587	116

Note. N = 96. HAB = hostile attributional bias. Significant betas are in bold. ** $p < .01$

Hypothesis 4

Hypothesis 4 stated that provocateur motivation would distinguish between aggressive, anxious, and comorbid individuals such that proactive provocateur motivation would be uniquely associated with aggression, reactive provocateur motivation would be uniquely associated with anxiety, and a combination of both motivations would be related to comorbidity. To test this hypothesis, a series of regressions testing for main effects and interactions were conducted. Proactive and reactive motive suspicion were entered as the dependent variables; anxiety, aggression and an interaction term of anxiety (centered) by aggression (centered) were entered simultaneously as predictors. Results (found in Table 6), though significant, did not support this hypothesis. The only significant relation found was between anxiety and proactive motive suspicion ($\beta = .345$, $p < .01$). Aggression was not significantly associated with proactive motive suspicion ($\beta = .077$, $p = .50$) and reactive motive suspicion was not significantly associated with anxiety ($\beta = .182$, $p = .09$) or aggression ($\beta = .092$, $p = .45$).

Table 6 - Regressions for Aggression/Anxiety Predicting Proactive/Reactive Motive Suspicion

	Model R^2	β	*t*	*p*
Model Predicting Proactive Motive Suspicion				
Aggression	.175**	.077	.672	.503
Anxiety		**.345**	3.467	.001
Aggression x Anxiety Interaction		.141	1.291	.200
Model Predicting Reactive Motive Suspicion				
Aggression	.059*	.092	.758	.450
Anxiety		.182	1.712	.090
Aggression x Anxiety Interaction		.048	.407	.685

Note. N = 96. Significant betas are in bold. *$p < .05$, ** $p < .01$

Discussion

Due to the high rate of overlap between externalizing and internalizing symptoms in children (Costello et al., 2004), research that examines factors associated with this overlap is critical to inform effective interventions. The present study sought to examine unique patterns of comorbidity between anxiety and aggression (the forms, functions, and subtypes) and to investigate whether certain cognitive variables (i.e., hostile attributional bias and perceived provocateur motivation) were associated with this overlap. Given that the literature suggests that anxiety differentially relates aggression such that comorbidity is more likely for certain forms, functions, and subtypes of aggression (i.e., reactive and relational; Raine et al., 2006; Loukas et al., 2005), the first aim of the study was to compare associations between anxiety and relational aggression, reactive aggression, and reactive relational aggression. Neither relational aggression nor reactive aggression was significantly associated with anxiety once overt aggression and proactive aggression (respectively) were controlled for in the regression analyses. However, after controlling for both the opposite "form" (i.e., reactive overt aggression) and the opposite "function" (i.e., proactive relational aggression), reactive relational aggression remained significantly associated with anxiety. These results are consistent with previous research (Marsee et al., 2008) and suggest that conceptualizing aggression as four subtypes may allow for more nuanced associations with other variables to be identified. In the case of the current study, assessing aggression via a measure of form-function combinations identified comorbid anxiety better than either the form or function alone. Interestingly, the bivariate associations for the different subtypes of aggression (reactive relational aggression versus proactive relational aggression or reactive overt aggression) were not significantly different from one another. Essentially, considering their respective correlations with anxiety as equal did not significantly

alter the statistical model. That being said, reactive relational aggression showed a unique relationship to anxiety in the regression analyses, while reactive overt and proactive relational aggression did not. It appears then, that there may be a unique relationship between reactive relational aggression and anxiety specifically, but these results are certainly not definitive.

Marsee et al. found similar results (i.e., a significant link between anxiety and reactive relational aggression) in a sample of youth in 2008. They argued that their results support the theory that anxious children are more likely to use relational aggression as a means of retaliation. These results support and, to an extent, extend this notion, as considering form or function alone did not significantly predict anxiety in the present study. Theoretically, the form and function of aggression relate to different aspects of anxiety. Engaging in relational aggression is consistent with the idea that anxious individuals seek to minimize direct conflict and confrontation with an aggression target (e.g., Loudin et al., 2003; Loukas et al., 2005). Functionally, reactive aggression and anxiety are thought to have similar underlying mechanisms such as emotional regulation problems and cognitive biases (e.g., Fite et al., 2010; Vitaro et al., 2002). As such, significant relationships with both of these manifestations of aggression were expected but not found. Instead, these results suggest that considering the form or function of aggression in isolation is not enough when looking for unique relationships to anxiety. The present findings support the growing movement in aggression research to consider the four subtypes as separate and distinct from one another, with each demonstrating unique relationships to various correlates and, by extension, presenting a diverse set of characteristics to practicing clinicians. As such, future research should focus more on these subtypes and the unique differences in associated conditions.

The second goal of this study was to examine HAB as it relates to anxiety and aggression, as well as investigate it as a possible mediator in comorbid individuals. Contrary to expectations, HAB was not significantly related to either anxiety or aggression in this study. Even when used alone as a predictor, HAB showed no significant relations to anxiety, total aggression, reactive aggression, reactive relational aggression, or reactive overt aggression. There are several possible explanations for these findings. Conceptually, HAB is a single, and very specific, step in the social-information processing (SIP) process (Crick & Dodge, 1994), so studying its association with anxiety and aggression in isolation can only tell so much of a much larger story. Research investigating this model (e.g., Crick et al, 2002, Gifford-Smith & Rabiner, 2004) has shown that aggressive responses, are not determined by a single step, but by combinations of them. Considering other variables from the Crick and Dodge (1994) SIP model such as intention-cue detection deficits (Dodge & Coie, 1987), as well as factors such as emotional dysregulation (Card & Little, 2006) and peer victimization (Camodeca et al., 2002) could potentially explain these nonsignificant findings. In short, HAB alone may not be a strong enough predictor of aggression forms, functions, and subtypes. Perhaps, rather, multiple SIP deficits need to be combined into distinct profiles that differentially relate to these different manifestations of aggression. Similar findings have been reported for anxiety, with significant relationships for attention to negative information, selective memory recall of negative words, perceived interpersonal skills, and peer victimization all significantly contributing to anxiety beyond HAB (Reid et al., 2006; Hoglund & Leadbeater, 2007). It is possible that these elements, when studied together with HAB, could better distinguish the profile of different anxious and/or aggressive individuals.

An important point to remember here is that HAB is a very specific SIP deficit; it requires interaction with one or more individuals as well as an ambiguous provocation (Dodge, 1980). Consider these requirements versus those for, say, self-efficacy. A significant part of the "response decision" step in Crick and Dodge's (1994) SIP model, self-efficacy refers to an individual's sense of confidence in their ability to carry out an action. While self-efficacy within the SIP model relates to social interactions specifically, it has been studied independently as a general confidence in one's abilities in both aggression and anxiety research. Findings generally indicate that aggressive individuals tend to have a higher sense of self-efficacy (e.g., Barchia & Bussey, 2011; Puckett, Aikins, & Cillessen, 2008), while anxious individuals tend to have a lower one (e.g., Rudy, Davis, & Matthews, 2012; Niditch & Varela, 2012). In these studies, it is important to note that the concept of self-efficacy extends to situations beyond directly experienced interactions. Unlike the components necessary to assess HAB, self-efficacy requires neither provocation, nor ambiguity. As such, the unique effects of HAB may only become apparent when it is considered in conjunction with these broader deficits (i.e., as it relates to constellations of deficits).

Methodologically, the present study assessed HAB using vignettes (e.g., someone spills milk on you") followed by a yes/no question ("In this story, do you think the kid was trying to be mean or not trying to be mean?"). The reliability for the HAB item following these vignettes was unacceptably low ($\alpha = .56$). Preston and Colman (2000), when assessing the same constructs using scales that ranged from 2- to 11-point responding formats, found that the 2-, 3-, and 4-point scales were significantly less reliable than those using more points. They concluded that optimum Likert scales fall the between 5- and 7-point length. Crain et al. (2005) applied a similar interpretation when they failed to find significant associations between HAB for relational

provocations and relational aggression. They argued that even a three-point rating system (0 = not trying to be mean, 1 = maybe trying to be mean, 2 = definitely trying to be mean) might have been too restrictive for participant responding (i.e., it did not capture less-than-absolute attributions such as "probably trying to be mean").

Converse et al. (2008) found results suggesting that a forced-choice style of measurement in a personality test may produce negative test-taker reactions. They noted that, compared to those using a Likert style personality measure, forced choice test-takers showed lower scores of test-taking ease and positive affect, and higher scores of test-taking anxiety. Granted, this study did not examine these same variables, however these results are interesting when considering the markedly lower reliability for the dichotomous HAB variable. It could be possible that the present study suffered issues similar to Converse et al. such that the forced choice format may have produced a negative reaction in participants, thereby affecting the responses they gave (i.e., selecting randomly or inconsistently). Although testing this theory was not an original goal in the present study, these findings provide support for further changes to be made in future research assessing HAB. Beyond the consideration of provocateur motive, these results suggest that it may also be beneficial to employ Likert rating scales in the quantitative measurement of HAB.

Additionally, consideration of the specific means by which HAB was assessed in this study is warranted. There is significant evidence to support the idea that the style of measurement of HAB is strongly related to the effect sizes found. In a meta-analysis of 41 studies assessing for relationships between HAB and aggression, Orobio de Castro et al. (2002) found a range of effect sizes depending on the measurement of HAB. The strongest effects (R^2 = .55) were found in studies that staged ambiguous provocation scenarios in a laboratory setting for participants (e.g., switching testing rooms with a confederate and returning to find that a

puzzle in progress had been knocked on the floor). Medium effects were found in studies reading vignettes to participants (R^2 = .24), and small effects were found in studies that used either pictures or video of the vignettes shown from a third-person perspective (R^2 = .09 for video, R^2 = .02 for pictures). For the current study, animations from a first-person perspective and narrations were used to present the vignettes to participants, followed by a series of questions read to them by a trained graduate student. Previous work using this version of the vignettes (Kunimatsu et al., 2012) found them to be comparable, both in terms of internal consistency reliability and item correlation, to the traditional written version of the vignettes. Additionally, this version of the vignettes demonstrated an ability to predict aggression beyond the written vignettes in a previous study (Kunimatsu et al., 2012).

In the present study, however, HAB did not significantly relate to either aggression or anxiety, and it is possible that using an animated version of the vignettes is the reason why. Perhaps viewing the animations of the stories enhanced the ambiguity of the provocateur's intentions in participants' minds. It is possible that seeing the story play out on screen from a first-person perspective changed individuals' interpretations of the events from what they would have had in simply reading the vignettes. Reading the stories without visual cues may lead to more personal interpretations, making participants more likely to see the provocations as either intentional or benign depending on how they are imagining them. Seeing the stories acted out by an animated character, on the other hand, could change that interpretation and lead to participants' changing their responses from those in the written vignettes. Given that this sample showed a strongly negatively skewed distribution for aggression, this potential enhanced ambiguity could have influenced the lower scores found for overall HAB. In a similar vein, the vignettes used in this study are based on ones designed almost 20 years ago (Crick, 1995). It is

entirely possible that the scenarios presented in these stories are no longer culturally relevant or provocative enough for participants to endorse HAB.

The final goal of this study was to examine potential differentiation of perceived proactive and reactive provocateur motivations as they relate to anxiety, aggression, and comorbidity. Research indicates that people tend to view proactive motives for aggression as less favorable and are more likely to endorse aggressive responding (Reeder et al., 2002). Additionally, anxiety research tends to reflect the idea that anxious individuals tend to personalize provocations and blame themselves for negative outcomes (Prinstein et al., 2005). Considering this research, the expectation in the current study was that proactive motive suspicion (e.g., "The kid spilled paint on my project because he wants a better grade than me") would significantly relate to aggression, reactive motive suspicion (e.g., "The kid spilled paint on my project because he is mad at me for something") would significantly relate to anxiety, and anxiety/aggression comorbidity would be associated with higher scores for both motive suspicions. However, results were not consistent with these expectations.

Aggression was not significantly linked to proactive motive suspicion in this study. Moral development research (e.g., Reeder et al., 2002) indicates that individuals are more likely to make significantly less positive evaluations and endorse stricter punishments when told that an aggressive act was proactively motivated. One possible explanation for failing to find a significant relationship between proactive motive and aggression is that the provocation must be explicitly aggressive for the specific motivation to evoke an aggressive response. Reeder et al.'s participants were presented with an overtly aggressive act, not an ambiguous one like those in the vignettes in this study. Perhaps the ambiguous nature of the stories, combined with the overall low HAB and aggression endorsements in this sample lead to these nonsignificant

findings. Essentially, it is possible that the majority of participants in this study did not view most of the vignette provocations as hostile in nature, and were therefore less likely to endorse proactive motivations, as aggression would not be an appropriate response in these situations. Additionally, HAB and aggression scores in this sample were very low (M = 3.71 and M = 10.87, respectively), further limiting the statistical possibility of finding significant results. Perhaps no significant relationship between aggression and perceived proactive provocateur motivation was found, because individuals with those biases were not in this sample. Future research will benefit from assessing for this relationship in more highly aggressive populations.

Of the different associations, only anxiety and proactive motive suspicion were significantly linked. This is contrary to the expectation that reactive motive suspicion would show a significant association with anxiety. As mentioned before, there is evidence to suggest that anxious children are more likely to attribute negative experiences to themselves (e.g., Prinstein et al., 2005), as well as less likely to agree with proactive motivation explanations given by hostility endorsing peers (Freeman et al., 2011). Given this research, the results of the present study are essentially the opposite of what was expected. That being said, there are multiple possible explanations for these findings. The first is that the proactive motives used in assessment were not explicitly hostile (e.g., "The girl can't hang out after school because she wants to hang out with the more popular kids instead"). Participants may have viewed these motive options as alternative benign reasons and therefore endorsed them more frequently. Pederson (2006) found that individuals with a positive view of a provocateur in a story (i.e., a friend) were more likely to attribute an act of aggression to an external circumstance. In short, they deemed the unfortunate outcome of the story to something beyond the provocateur's character. It could be that anxious participants in this study showed a similar tendency and

endorsed more proactive motives because those were seen as "not trying to be mean." Additionally, because the provocateurs in this story are described either as "boy," "girl," or "kid(s)" and portrayed as basic animated figures, participants may not have personalized the stories as much as they would have if they read the stories themselves or if videos of real people were used in place of the animations. Given that this version of vignettes has yet to be widely tested in different populations, its ecological validity is certainly still in question. Similar to the nonsignificant findings relating to HAB, the relationship between perceived reactive motive suspicion and aggression may not have been found because participants did not relate enough to the stories in order to attribute the outcomes to themselves (Orobio de Castro, 2002).

Lastly, and perhaps most importantly, the present measure did not include any dispositional or personality-based items for participants to endorse (e.g., "The kid knocked over my books because he/she is a bully"). Hostile provocateur disposition items are present in forced-choice form in older measures of HAB (e.g., Crick, 1995) and research suggests that provocateurs portrayed as having these types of motivations (i.e., internal characteristics that make hostile actions consistent with their character) tend to be evaluated more negatively in assessment (Pederson, 2006; Kremer & Stephens 1983). Further, studies of aggression and anxiety independently suggest a heightened sensitivity to perceiving threat (e.g., Dodge & Coie, 1987; Card & Little, 2006; APA, 2013, Barlow, 2002). It is possible that instead of attributing a specific (i.e., proactive or reactive) motivation to a provocateur's *actions*, anxious and aggressive individuals instead have a tendency to make general negative attributions to the provocateur's *personality*. Future research will benefit from including dispositional items in addition to proactive and reactive motivation items when assessing for HAB and similar cognitive biases.

Limitations

Despite the interesting results found in this investigation, it is not without limitations. First and foremost, the sample used is somewhat limited in both size and generalizability. In terms of sample size, this study may not have had enough participants to be adequately powered to detect smaller effects. This limitation is especially salient with regards to Hypothesis 3, which was looking for unique effects in a group of highly correlated constructs. Effect sizes for associations between HAB and aggression tend to show a very broad range from $r = .02$ to $r = .55$ (Orobio de Castro et al., 2002). It is likely that unique relationships between the various manifestations of aggression and HAB could not be detected with the number of participants in this study. Additionally, the scores for both aggression and HAB were strongly negatively skewed. This is common and expected in community samples (e.g., Marsee et al., 2012), but is still limiting in terms of what can be found as statistically significant. With regards to generalizability, we cannot speak to the representativeness of this sample as it was volunteer-based, and these findings may not be found in other specific populations. These results were found in a non-referred community sample, so in order to extend these findings to other groups such as detained adolescents, at-risk youth, clinical samples, or younger children requires further study.

Another problem encountered in conducting this study was the issue of multicollinearity when examining the forms, functions and subtypes of aggression. Due to their high degree of correlation with one another, our sample displayed VIF values in excess of what is normally deemed acceptable (Tabachnick & Fidell, 2007). According to Allison (1999), while multicollinearity does not bias regression coefficients, it does make them unstable and will likely make each variable appear to have weaker effects. This explanation sheds light on the

nonsignificant findings in Hypothesis 2, however, the solution Fox (1991) gives as the ideal means of coping with collinear data is to collect new data in way that avoids it (i.e., through experimental manipulation). Other suggestions for solving the issue of collinear variables is to either delete, or combine them and examine the variables as a set rather than individually. The goal here, however, was to examine the individual contributions of each form, function, and subtype on anxiety and HAB, so these options are not particularly optimal. If the unique effects of these highly correlated subtypes are to be discovered, a much larger sample is likely needed.

The results of this study also highlight potential methodological and conceptual issues in the assessment of HAB and perceived provocateur motivation. As mentioned above, the HAB variable showed particularly poor reliability, potentially due to its dichotomous nature (Converse et al., 2008). HAB research shows a huge amount of variation in effect size, depending on how the construct is assessed (Orobio de Castro et al, 2002). The mean score for HAB was only 3.71, which is small. It is likely that the assessment method in the current study was not evocative enough to produce HAB scores that could have statistically significant results. Future research focusing on HAB should consider employing Likert scales for quantitative assessment and/or procedures that involve participants more (e.g., experiencing an actual ambiguous provocation during assessment).

With regards to provocateur motivation, the measure used in this study may be lacking. As mentioned above, motive items were based on previous forced choice items (i.e., Q: Why did the kid knock the books off of your desk? A: 1) it was an accident, 2) because he/she is mean, etc.) from the older (Crick, 1995) version of the vignettes. Researchers modified these items to explicitly measure proactive or reactive motive suspicion. These adjustments were not made based on participant input, but simply at the researchers' discretion based on other measures of

proactive and reactive motivation (e.g., Arsenio et al., 2009). As such, it is entirely possible that the items used to assess provocateur motive (e.g., "How likely are you to think that you weren't invited because the girl only wants the most popular people to come to her party?") do not reflect common thoughts experienced by the youth in this study. Further, the proactive motivations in particular did not directly imply hostility, making interpretation of results more difficult as the assertion that proactive motive suspicion is an extension of HAB cannot be made. Additionally, the present measure did not include any dispositional or personality-based items for participants to endorse. As a result the possibility that internal motivations not considered either proactive or reactive drive attributions of intent, aggression, and anxiety was not investigated. Future research into the influence of perceived provocateur motive will benefit from using a free response item to assess motive (i.e., "Why do you think the things in this story happened?" and developing a coding system for proactive, reactive, benign, and other (e.g., dispositional/personality) motivations as well as distinguishing explicitly hostile from nonhostile ones.

Implications

Despite the limitations of this study, the results suggest that there is a unique relationship between anxiety and aggression. Specifically, anxiety appears to be uniquely related to reactive relational aggression, but not relational or reactive aggression alone. These findings stress the importance of considering aggression in terms of the four form-function subtypes, rather than considering either form or function alone. Considering both the manifestation (relational) and the motivation (reactive) that drives aggressive behavior is the most comprehensive way to look at an aggressive act and, when considering known correlates of aggression (e.g., anxiety), the most effective way to make distinctions between the various aggression profiles.

This study failed to find unique significant associations between HAB and any other variable. These results highlight the conceptual narrowness and frequent measurement difficulties associated with this construct. HAB is one of a group of constructs associated with different aggressive behaviors. Future research should focus on these other factors, SIP mechanisms as well as other known correlates such as emotional dysregulation, and other, broader cognitive biases (e.g., personalization) in conjunction with HAB and aggression. As mentioned previously, the HAB literature shows an extraordinary range of effect sizes, with both significant and nonsignificant results, depending on assessment method (Orobio de Castro, 2002). Future research should focus on improving the current common measures of HAB (i.e., the vignettes) such that they are comparable to the most effect measures of HAB (i.e., actual ambiguous provocation). If HAB is to be considered—as it has been—as something to be targeted in the treatment of aggressive individuals (e.g., Bailey & Ostrov, 2008, Crick & Dodge, 1996), it should go without saying that the assessment of this construct needs to be both reliable and demonstrate predictive utility.

By investigating the role of perceived provocateur motive, this study sought to expand on the theoretical concept of HAB. That being said, these results have clinical implications as well. Research has demonstrated that people make moral evaluations (e.g., Reeder et al., 2002) and determine punishment (e.g., Keller et al, 2003; Leahy, 1979) based on the motive (proactive or reactive) behind an aggressive act when viewing it from the third-person. Studies have also suggested that anxious individuals often also attribute motivations to provocateurs actions (e.g., Freeman et al, 2011) but that they are usually more self-blaming when considering negative outcomes (Prinstein et al., 2005). The results of this study suggest that there is a relationship between perceived provocateur motivation and anxiety, but not aggression. Future research

should examine the potential roles of both proactive and reactive motive suspicion more intensely, as this is a very new area of study. Clinically, these specific cognitive biases could become targets of therapeutic interventions. At the present moment, however, much more remains to be learned about the role of perceived provocateur motivation in psychopathology.

Conclusions

The goals of this study were to assess the unique associations of anxiety and HAB with the forms (relational and overt), functions (proactive and reactive), and subtypes (reactive relational, reactive overt, proactive relational, and proactive overt) of aggression and to examine the potential role of perceived provocateur motivation in anxiety and aggression. Results indicated that anxiety is uniquely associated with reactive relational aggression. However, a unique relationship was not found between HAB and either aggression or anxiety. The results for the hypothesis regarding the association between provocateur motivation and aggression versus anxiety were contrary to expectations, with unique results found between proactive motives and anxiety. These findings add to the literature calling for a better understanding of the comorbidity between internalizing and externalizing problems, more salient assessments of HAB, and suggest that considering perceived provocateur motive may be important in designing unique interventions for individuals who show either anxiety or aggression (e.g., motivation-specific cognitive interventions). Overall, the present study adds some significant findings to the current literature but, as always, more research is needed to parcel out unique details to be used for more individualized, effective interventions.

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