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Examining the Effects of Trait Rumination on Hostile Attribution Bias

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Examining the Effects of Trait Rumination on Hostile Attribution Bias

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ABSTRACT

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by

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Previous research supports the idea that individuals high in trait anger tend to experience more

hostile attribution bias. According to the Integrative Cognitive Model, cognitive factors, such as

rumination, may increase the risk of hostile attribution bias and any subsequent aggressive

behaviors. Sex differences are apparent in rumination and anger expression. The present research

explored the potential role trait rumination plays in hostile attribution bias as well as potential

conditional effects of sex on this relationship. Participants were asked to complete a number of

self-report measures and vignettes of ambiguously hostile situations adapted to improve

reliability. Hypotheses were largely supported and trait anger rumination was significantly

predictive of hostile attribution bias; however, conditional effects of sex were non-significant.

The adapted hostile attribution bias measure had improved reliability and may have utility for a

survey-based method to assessing hostile attribution bias. Findings may further our

understanding of hostile interpretations and potential for subsequent aggressive behaviors in high

trait ruminators in ambiguous situations as well as lead to potential areas of intervention to

reduce anger and anger rumination.

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CHAPTER 1

INTRODUCTION

Cognitive processes, such as rumination, are known to exacerbate and prolong emotional experiences and influence subsequent behavioral expression. With anger, rumination can worsen and lengthen the emotional experience as well as increase the risk of aggression. Anger expression is also influenced by contextual cues, physiological reactivity, genetic predispositions, and perceptual biases including hostile attribution bias; however, little is known how some cognitive processes within anger influence one another. The current study examined trait rumination and hostile attribution bias in the expression of anger.

Rumination

Rumination is defined as "a mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms" (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, p. 400). Nolen-Hoeksema and colleagues originally identified a ruminative style of thinking from the depression literature (Nolen-Hoeksema, 1991; Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Nolen-Hoeksema, Parker, & Larson, 1994; Nolen-Hoeksema et al., 2008).

Rumination was shown to exacerbate a person's mood after provoking situations, where a person would continually focus and evaluate negative perceptions, in turn exacerbating their depressed mood and decreasing the likelihood of engaging in enjoyable activities or behaviors that may distract them (Morrow & Nolen-Hoeksema, 1990). Morrow and Nolen-Hoeksema (1990) found that participants assigned to a passive rumination task reported more sadness than participants assigned to an active rumination, passive distraction, or active distraction tasks. During natural disasters, individuals experiencing depression who engaged in rumination prior to

the disaster reported more depression in the following weeks after the disaster (Nolen-Hoeksema & Morrow, 1991). These studies suggest that individuals who focus on their symptoms and possible causes of their emotions tend to remain symptomatic longer than those who distract themselves to cope. This has since been extended to other negative mood states, including anger (e.g., Rusting & Nolen-Hoeksema, 1998), but it is worth examining the original conceptualization in greater depth.

Rumination Theories

The ruminative style of thinking led to the development of the response style theory of depression, which describes how rumination amplifies and prolongs a depressive episode by interfering with maintaining simple instrumental behaviors (e.g., hygiene upkeep or general health care; Kuhl, 1981). Rumination is believed to increase the chance that an individual in a depressive episode will consider more depressive explanations for his or her current mood state and increase the accessibility of negative memories (Diener & Dweck, 1978; Kuhl, 1981). The ruminative response style theory proposes three mechanisms thought to exacerbate depressed mood: interference with attention, concentration, and instrumental behaviors (e.g., basic social skills), enhancement of existing maladapative cognitive styles, and increased chances of considering depressive explanations for depressed mood (e.g., Diener & Dweck, 1978; Kuhl, 1981; Morrow & Nolen-Hoeksema, 1990).

A competing theory, called reduced concreteness theory, proposes that rumination reduces concrete and/or abstract, negative thinking styles (e.g., Watkins & Moulds, 2005). Lowered concrete thinking was believed to reduce vivid imagery experiences, inhibit activation of underlying emotion structures, and impede emotional processing (e.g., Foa & Kozak, 1986; Watkins & Moulds, 2005). Watkins and Mould (2005) demonstrated that depressed participants

expressed more abstract-type thinking prior to rumination induction, and when induced with more concrete thinking they reported better problem-solving.

Rumination Types

Research suggests that some types of rumination may be more functional than others. Concrete rumination is a non-evaluative rumination type characterized by a self-focus on an individual's feelings more directly and intimately, where individuals tend to focus on 'how' an event occurred and think about specific, concrete actions or events leading to those outcomes (Rimes & Watkins, 2005; Showers, 1988; Teasdale, 1999). Watkins and Moulds (2005) described concrete rumination as more adaptive or advantageous, as the focus is on more unstable causes of negative events, which may influence the perception of control and problem-solving. This type of rumination tends to facilitate emotional processing and is associated with specific, contextual details about emotionally-provoking situations (e.g., Watkins, 2008).

Another type of rumination is known as abstract rumination, which is believed to be more maladaptive compared to concrete rumination (Teasdale, 1999). Abstract ruminators tend to focus on goal-related discrepancies and 'why' events occurred, including underlying traits and stables causes of the events (e.g., Nolen-Hoeksema et al., 2008; Rimes & Watkins, 2005; Showers, 1988). Abstract rumination may be considered disadvantageous because the individual focuses on factors of events that cannot be controlled or changed, and thus bolsters depression and perceived loss of control. Abstract rumination facilitates emotional processing differently than concrete rumination, where the focus is not on concrete, situational details but rather on general, indistinct details that are more likely to be cross-situational.

Similar distinctions between subtypes of rumination were found in a measure developed by Treynor, Gonzalez, and Nolen-Hoeksema (2003). The brooding subscale was associated with

passive comparisons of an individual's current situation with an unachieved standard, while reflective pondering was related to an individual turning inward, increasing the chances of problem solving. Although the current review uncovered no measures that focused directly on abstract or concrete rumination, similarities are apparent between brooding and abstract rumination as well as reflective pondering and concrete rumination. It may be the case that Treynor's et al. (2003) methodology could be used as a measure of abstract and concrete rumination.

Effects of Rumination on Anger

As noted above, rumination was found to impact other emotional states, such as anger. Siewert and colleagues suggested rumination was a typical response to anger and the focus of rumination tended to be explanation- or solution-focused (Siewert, Kubiak, Jonas, & Weber, 2011). In addition, trait anger moderated the effect revenge-focused rumination had on social well-being (Siewert et al., 2011). Angry individuals were proposed to hold metacognitive beliefs unique to anger (Simpson & Papagerogiou, 2003). Metacognitive beliefs are similar to rumination and related thoughts/feelings after emotional activation and may be related to thought processes and a person's ability to regulate them (Simpson & Papageurogiou, 2003). For example, negative metacognitive beliefs may involve rumination and detrimental effects on functioning in interpersonal situations. In a recent study, rumination was found to predict anger and aggressive behaviors after provocation in individuals who held positive beliefs about rumination (i.e., believed rumination may assist in problem solving) compared to those with negative rumination beliefs (Krans, Moulds, Grisham, Lang, & Denson, 2014).

In a more recent study, it was shown that rumination was related to exacerbated anger post-provocation (Peled & Moretti, 2010). In experimental conditions, rumination played a key

role in the experience and expression of anger (Ray, Wilhelm, & Gross, 2008; Rusting & Nolen-Hoeksema, 1998). In addition, following anger-provoking stimuli, participants instructed to ruminate tended to report more anger and aggression and were at a higher risk of retaliation (Bushman, Bonacci, Pederson, Vasquez, & Miller, 2005; Maxwell, 2004). Sukhodolsky, Golub, and Cromwell (2001) identified a different type of rumination, independent of depression, called anger rumination.

Anger rumination is believed to involve three different processes that influence the experience of anger: memories of past anger experiences, attention to immediate anger experiences, and counterfactual thought about anger experiences (Sukhodolsky et al., 2001). More specifically, memories of past anger episodes may trigger current anger states, in turn leading to increased attention to anger that may amplify its intensity/duration, and counterfactual thoughts may lead to negative consequences (e.g., retaliation). According to Sukhodolsky et al. (2001), after initial provocation, individuals who experience anger would either continue to focus on their current angry mood or sporadically return their attention back to the event at a later time.

Through a path analysis, Peled and Moretti (2010) found rumination related to anger is distinct from rumination related to sadness, though both were independently predictive of aggression. Anger rumination may be related to trait physical and verbal aggression and hostility (Anestis, Anestis, Shelby, & Joiner, 2009). One possible reason why anger rumination increases the risk of aggression may be related to resource depletion related to self-control (i.e., effortful control; Denson, 2009).

An individual's capacity for self-control is believed to be a limited, yet renewable, resource that may be depleted (Baumeister, Vohs, & Tice, 2007). Denson (2009) proposed that individuals may be motivated not to ruminate after anger provocation, as rumination is intrusive

and aversive in nature. However, ceasing rumination processes requires a significant amount of the limited amount of effortful self-control, as the individual must down-regulate the intensity of their anger experience, suppress anger thoughts, and refrain from aggressive urges. Some studies further support that anger rumination reduces self-control (i.e., increases demands on executive control mechanisms) after provocation and increases the risk and severity of aggression (Denson, 2009; Denson, DeWall, & Finel, 2012a; Denson, Pederson, Friese, Hahm, & Roberts, 2011). Effortful control was found to partially mediate the relationship between anger rumination and reactive aggression (White & Turner, 2014).

Influence of Reappraisal and Distraction

Related to effortful control, distraction and reappraisal processes are believed to be some of the most effective ways to reduce rumination's impact on negative emotions (e.g., anger or depression; Denson, Moulds, & Grisham, 2012b; Fennell & Teasdale, 1984). Fennell and Teasdale (1984) found depressed individuals in a distracted condition (i.e., instructed to focus on non-emotional stimuli, such as slides of an outdoor scene) alleviated their depressed mood more effectively than a control condition (i.e., instructed to look at a square white light projected on a wall). Blagden and Crask (1996) found similar results for individuals with anxiety, where individuals assigned to distraction groups reported lower anxious mood compared to rumination conditions. An alternative to reduce rumination may be reappraisal, which may facilitate adaptive processing of anger memories in turn reducing the experience of anger (Denson et al., 2012b). Reappraisal is a process in which an individual mentally modifies how an individual evaluates a situation, prior to the full emotional response (Gross, 2002).

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Sex Differences

Multiple studies have shown sex differences in rumination as well as anger (e.g., Frodi, 1978; Nolen-Hoeksema et al., 1994). Women were frequently found to be more likely to use depressive rumination as a coping strategy than men (e.g., Nolen-Hoeksema et al., 1994; Watkins, 2004). In a recent meta-analysis, Johnson and Whisman (2013) found that women tended to score higher on self-report measures of trait general rumination as well as brooding and reflection (i.e., reflective pondering). Further supporting a sex difference and preference toward rumination, Nolen-Hoeksema (1987) observed that male college students tended to focus on distraction-type tasks that focused attention away from depression (e.g., engaging in physical activities). Women tended to focus on maintaining attention on depressive symptoms, which is indicative of a tendency to react in less active ways and more towards rumination.

However, sex differences in anger rumination may be in the opposing direction, where men may be more likely to ruminate than women. For example, one study found that men were angrier and expressed more negative and aggressive content when asked to record their thoughts after provocation and showed elevated physiological responses (e.g., increased heart rate; Frodi, 1978). In another study, Bushman (2002) found similar sex differences, in that men were angrier and more aggressive in a rumination condition compared to women in the rumination condition and both sexes in the distraction condition. Rusting and Nolen-Hoeksema (1998) found similar results, such that men and women reacted differently when provoked. For example, when given a choice to engage in rumination or distraction after provocation, men were equally likely to choose either task but women were more likely to choose rumination in a neutral mood or distraction in an angry mood.

Another study by Verona (2005) found women may be likely to aggress as measured by a display of shocks delivered to a 'confederate' during rumination. Verona (2005) selected various levels of trait rumination in men and women and assigned them to conditions, one of which was aggressive in nature (i.e., participants were given a chance to administer fake shocks). Results showed that all participants who ruminated administered more shocks with ruminating women administering the most shocks compared to men. Further, research supports that men and women react differently to anger provocation. Knobloch-Westerwick and colleagues found that men had a preference for anger experiences and chose to increase their exposure to emotionally-provocative news articles, while women had a preference for distraction and more positive news articles (Knobloch-Westerwick & Alter, 2006; O'Neal & Taylor, 1989).

State/Trait Anger

Anger is an emotional state that many individuals experience as a normal part of life. Anger is typically defined as a negative, self-perceived phenomenological state (Spielberger, Jacobs, Russel, & Crane, 1983; Spielberger et al., 1985). It is often thought that anger is triggered by provoking contextual cues, which result in a variety of cognitive, behavioral, or physiological responses (e.g., Kassinove & Sukhodolsky, 1995; Salzinger, 1995). Cattell and Scheier (1961) developed a theory that describes how emotions, such as anger, may be experienced in two different ways: as a transient mood state (also known as 'state') or as a dispositional personality dimension (a 'trait'). State anger is characterized by transient, subjective feelings of anger that may vary from mild irritation to rage (Spielberger, 1999). In contrast, trait anger is defined as a disposition to perceive a variety of situations as frustrating or annoying (Spielberger, 1999). Some research suggests that individuals high in trait anger tend to respond

more quickly with anger and are at higher risk of acting aggressively than individuals who are provoked, compared to those low in trait anger (e.g., van Goozen, Frijda, & van de Poll, 1994).

Aggression Types

Theoretically, two different types of aggression exist (e.g., Berkowitz, 1993): hostile aggression (i.e., impulsive, reactive, and motivated by a desire to cause harm) and instrumental aggression (i.e., intentional and proactive with some goal other than harming the victim). The Generalized Aggression Model suggests that aggressive behaviors may contain elements of both types, making these categories somewhat artificial (Anderson & Bushman, 2002).

Other researchers make a distinction between aggression based on the presence of anger called reactive and proactive aggression (e.g., Dodge & Coie, 1987). Reactive aggression is characterized by aggressive behaviors expressed out of anger, while proactive aggression is aggressive behaviors not expressed in anger but to help pursue another goal (Dodge & Coie, 1987). Both reactive and proactive aggression appear to share some characteristics with the aggressive types described in GAM. Reactive aggression is believed to be more trait-like in nature than proactive, as individuals higher in this trait are typically more likely to react in aggressive ways out of anger than others (e.g., Blair, 2001, 2004). Trait aggression overlaps in some ways with trait anger (e.g., measures of trait anger and aggression often reference reactive aggression; Wilkowski & Robinson, 2008); however, they have some subtle differences (e.g., Bettencourt, Talley, Benjamin, & Valentine, 2006; Wilkowski & Robinson, 2008). Trait anger and trait aggression are often correlated; yet, trait anger may only be a predictor of aggressive behavior in response to provocation (e.g., Bettencourt et al., 2006). Hence, various theorized cognitive processes have been invoked to explain possible links between trait anger and aggressive behavior.

<center>**Other Cognitive Processes and Anger**</center>

Hostile Attribution Bias

Wilkowski and Robinson (2008, 2010) posited that hostile attribution bias is an automatic bias toward hostile interpretations or situations and believed to lead to hostile interpretations in two possible ways: 1) high trait anger or trait reactive aggressive individuals have a heightened vigilance for hostile stimuli, in turn potentially leading to biased interpretations in a hostile direction (e.g., Blair, 2003; Dodge, 1991) or, 2) individuals with high amounts of these traits have preexisting hostile interpretations (i.e., trait rumination) that are reinforced (e.g., Bushman, 2002). A plethora of research supports the first proposal, where hostile interpretations occur early in information processing and occur separately from selective attention processes (e.g., Wilkowski, Robinson, Gordon, & Troop-Gordon, 2007). However, as described above, not as much research was completed on the second proposal.

Anderson and Bushman (2002) suggested that dispositional inferences occur early and automatically in processing information. This is further supported by Wilkowski and Robinson (2008), who described that high trait anger individuals may extract "hostile gist interpretations" (p. 10) early in processing of situations and should exhibit difficulties reconciling incompatible cues (i.e., nonhostile cues); therefore, they should preferentially attend to nonhostile cues in ambiguous hostile scenes because it takes them greater time and effort to interpret.

Wilkowski et al. (2007) tracked eye movements in ambiguous hostile scenes and found that individuals high in trait anger tended to experience greater hostile gist interpretations prior to encoding specific hostile or non-hostile stimuli. After this initial interpretation, individuals higher in trait anger also tended to preferentially attend to nonhostile cues suggesting that hostile stimuli per se are not instrumental to hostile attribution bias and that hostile biases are not

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necessarily operative during interpretation processes. Rather, Wilkowski et al. (2007) described that high trait anger individuals appear to have greater difficulties reconciling nonhostile cues into their initial hostile interpretation and that attentional biases toward hostile stimuli operates at a later time after interpretational processing is complete.

Other studies found that more aggressive individuals are more likely to interpret ambiguous situations as hostile, even without explicit instruction to do so (e.g., Zelli, Cervone, & Huesmann, 1996). The Integrated Cognitive Model (summarized below) describes how automatic interpretation processes, such as hostile attribution bias, may be corrected or exacerbated if further attentional resources are recruited via effortful processing versus rumination.

Aggression Theories

While historically a number of theories have described human aggression, two models seem to exhibit current broad-based support, namely the General Aggression Model and the Integrated Cognitive Model. The General Aggression Model (GAM) describes how a variety of factors may increase the risk of anger expression and aggressive behaviors (Anderson & Bushman, 2002). The GAM explains how aggression may be expressed through three factors: inputs, routes, and outcomes (Figure 1).
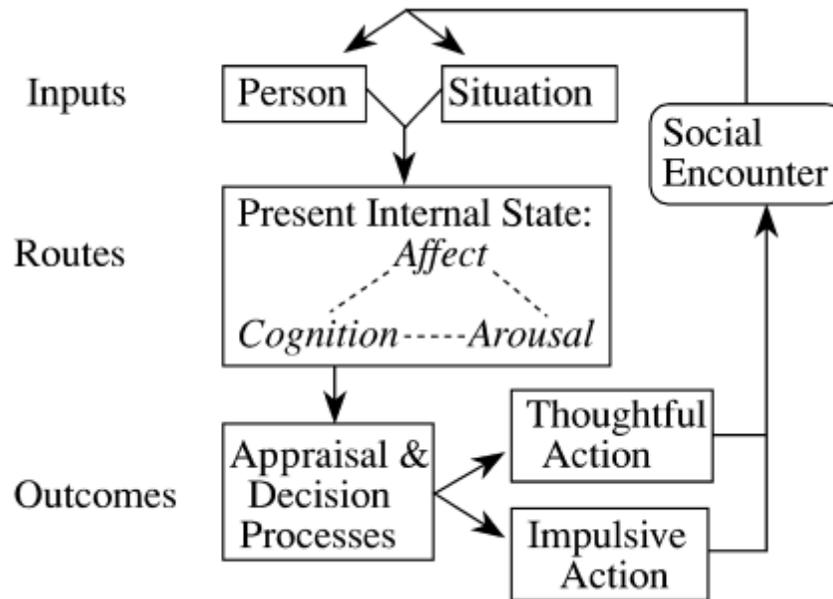
Figure 1. Generalized Aggression Model.

Note. Figure borrowed from Anderson & Busman (2002).

Inputs are causal factors that may influence the final outcome behavior and can be person-based (e.g., trait anger or sex-related) or situationally-driven (e.g., aggressive cues or provocation). Routes are internal processes that influence potential outcomes and are described as internal states, such as cognition, arousal, or affect. Cognition may influence aggression by increasing the accessibility of aggressive concepts in the individual's memory (i.e., priming) through hostile thoughts and scripts for responding. Finally, outcomes are the observable behavior that may include complex information processes (e.g., immediate appraisal, reappraisal, and decision processing). Aggression in the GAM is the critical outcome variable and defined as any behavior directed toward other individuals carried out with the intent to cause harm (Anderson & Bushman, 2002).

The GAM was developed to integrate various existing theories on the expression of aggression (Anderson & Bushman, 2002. As a social-cognitive model, an aggressive-related

knowledge structure (i.e., hostile thoughts and scripts) is believed to increase the accessibility of aggressive/angry memories, in turn increasing the risk of aggressive behavior expression. One of the main routes in which this aggressive knowledge structure is thought to increase aggressiveness is through the expression of affective states, such as anger (Anderson, Gentile, & Buckley, 2007). Aggressive scripts may be used as guides for behavior and social problem solving by accessing aggressive information learned over time (Huesmann, 1998).

Many studies utilize the GAM to explain aggressive responses to media and/or video games (e.g., Bösche, 2010; Hollingdale & Greitemeyer, 2013); however, many of these studies focused on cognitive styles rather than processes, such as rumination. Ferguson and Dyck (2012) suggested that the GAM may not be as sufficient in explaining aggression as it was when it was first developed, as much of the research supporting the cognitive components of the GAM are from studies on exposure to violence and subsequent priming effects of aggressive-related thoughts. Only one study was found that described how the GAM may explain rumination's influence on aggression, where rumination increased the accessibility of aggressive-related thoughts via increased reported angry affect (Pederson et al., 2011).

Another model called the Integrated Cognitive Model (ICM) of trait anger and reaction aggression was proposed by Wilkowski and Robinson (2008) to explain how other cognitive processes (e.g., hostile interpretations, rumination, or effortful control) influence trait anger and aggression (Figure 2). According to the ICM, individuals high in trait anger are more likely to automatically attend to hostile stimuli or perceive non-ambiguous stimuli as hostile through a process known as hostile attribution bias (Wilkowski & Robinson, 2008, 2010). These individuals are believed to be automatically biased toward hostile interpretations of situations, in turn leading to increased anger expression. Following interpretation biases toward hostility, the

ICM suggests that these individuals then may ruminate about the interpretation-related biases or reappraise the situation and recruit effortful control to suppress anger expression or aggression. Rumination is thought to exacerbate anger and prolong the risk of reactive aggression. If an individual lacks the capacity for effortful control processes, they are less likely to counteract anger and reactive aggression tendencies. In other words, low trait anger individuals are thought to be able to recruit cognitive control in hostile situations, thus less likely to prolong anger or exhibit aggressive behaviors, of which there are several possible types.
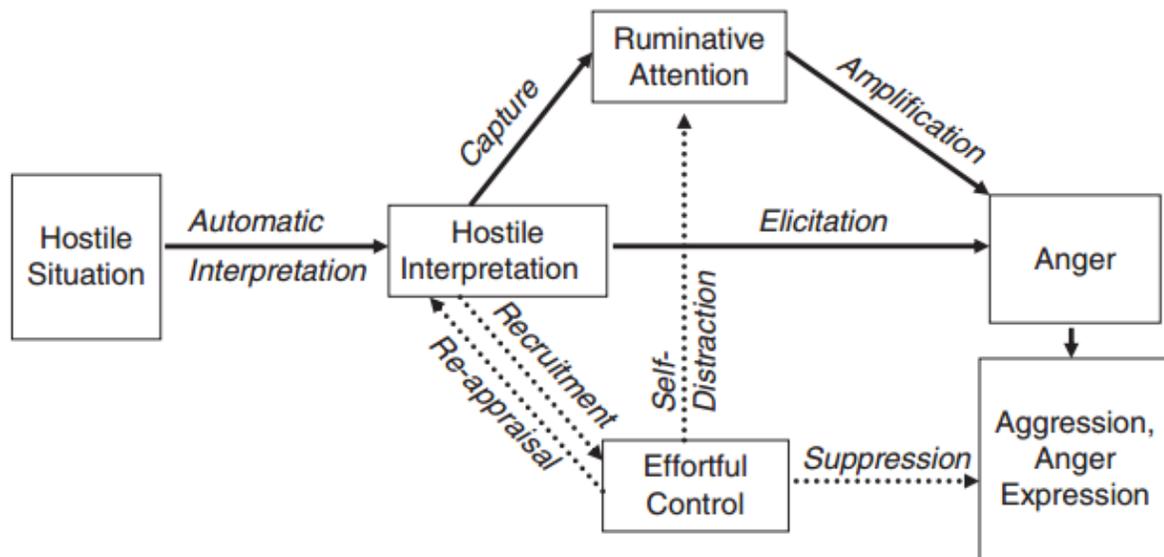
Figure 2. Integrated Cognitive Model of Trait Anger and Reactive Aggression.

Note. Figure borrowed from Wilkowski & Robinson (2008)

Effortful control may be useful in explaining situations perceived to be hostile via three specific pathways. The first is that recruiting effortful control resources may enable reappraisal of situational information to more non-hostile interpretations. A second pathway is that effortful control may interrupt rumination, allowing one to distract oneself from hostile thoughts. The third pathway posited is that effortful control resources may be used to suppress aggressive

tendencies and expressive behavior related to anger arousal (e.g., facial expressions; Dewall, Baumeister, Stillman, & Gailliot, 2007).

Many theories on aggression, including the GAM, may describe the importance of early, automatic and subsequent controlled processes that increase the risk of aggression; however, each theory differs on the specific processes they emphasize (Wilkowski & Robsinson, 2010). Cognition may not be monolithic in nature, as described in the GAM or other aggression theories; therefore an integrated cognitive model was developed to describe the component sub-processes of cognition in aggression (Wilkowski & Robinson, 2010). For this reason, the ICM may provide greater utility over the GAM in describing cognitive processes in the current project. The ICM appears to expand upon the GAM by providing more detailed pathways in which cognitive factors may influence one another in anger expression after provocation.

CHAPTER 2

RESEARCH OVERVIEW

Overall, the ICM proposed that hostile biases reinforce pre-existing hostile interpretations (Wilkowski & Robinson, 2008), which is consistent with literature on rumination (e.g., Rusting & Nolen-Hoeksema, 1998). However, most research in this area focuses on self-report or is described at the dispositional level (e.g., Collins & Bell, 1997; Martin & Dahlen, 2005). It is possible that self-report may not directly assess the complex cognitive process of rumination compared to other methodologies, such as measuring time to disengage from negative stimuli (for further review of this methodology see Siegel, Steinhauer, Carter, Ramel, & Thase, 2003). However, it may be that an effective self-report measure relating ambiguous stimuli to possible types of biased interpretations has not yet been fully developed.

Individuals high in trait anger tend to exhibit hostile attribution bias in provoking or ambiguously-provoking situations. In addition, trait anger and trait rumination tend to be significantly related; however, research is limited on how trait anger rumination directly influences hostile attribution bias. Sex differences are also apparent in the experience and expression of rumination and anger. The current research examined the relationships between trait rumination and hostile attribution bias as well as potential conditional effects of sex on the relationship between trait rumination and hostile attribution bias.

Hypotheses

1. Consistent with past research, it was expected that trait anger (measured by the Trait Anger Scale) would be significantly and positively related to trait rumination scores (measured by the Ruminative Response Scale and Anger Rumination Scale).

2. Trait anger rumination and general rumination would be positively associated with hostile and negative subscales of the Adapted Hostile Attribution Bias Vignettes.

3. The brooding subscale of the Ruminative Response Scale would exhibit stronger relationships with hostile attribution bias (measured by the hostile subscale of the Adapted Hostile Attribution Bias Vignettes) compared to the reflective pondering subscale.

4. The strength of the effect of trait anger rumination on hostile attribution bias (measured by the hostile subscale of the Adapted Hostile Attribution Bias Vignettes) would be conditional to sex of the participant, in which the strength would be greater for males as compared to females.

CHAPTER 3

METHOD

Participants

Five hundred and four students enrolled in psychology courses at a Southeastern university completed a battery of online questionnaires through an online participant pool called SONA (Sona Systems, Inc., 2012), in exchange for 0.5 extra credit coursework. One hundred and thirty-three participants (26.39%) were excluded from analyses because they finished the survey in less than 12.8 minutes (based on a minimum of 5 seconds per item) or declined to answer at least 75% of all items. The time-limit was a conservative estimate of time to maximize the potential participants would attend to every item and answer in an honest, reliable manner. Thus, 371 participants were included for all primary analyses. Two-hundred and fifty-seven (69.30%) of the included participants were female. Two-hundred and ninety-two participants reported as being Caucasian (78.70%), thirty-six as African American (9.70%), twelve as Asian (3.20%), eight as Hispanic (2.20%), two as Pacific Islander (0.5%), and eighteen as bi- or multi-racial (4.90%), with three participants not reporting on this variable. The average age of the included participants was 20.40 (SD = 4.52; $range$ = 18 to 52 years old). Demographic information for the excluded participants were as follows: sixty-six (49.60%) identified as female, eighty-six (64.70%) identified as Caucasian, nineteen as African American (14.30%), six as Asian (4.50%), two as Hispanic (1.50%), four as Pacific Islander (3.0%), and six as bi- or multi-racial (4.50%), with ten participants not reporting their race, and the average age of excluded participants was 19.66 (SD = 3.76; $range$ = 18 to 48).

<center>**Procedure**</center>

Participants were given informed consent and asked to fill out a number of self-report questionnaires and vignettes (described below). The surveys and vignettes were presented to participants in a random order to control for potential order effects. This study was approved by the Institutional Review Board at East Tennessee State University prior to data collection.

<center>**Materials**</center>

State-Trait Anger Expression Inventory - Second Edition

The State-Trait Anger Expression Inventory - Second Edition (STAXI-2; Appendix I; Spielberger, 1999) is a 44-item measure of an individual's anger and expression of hostility toward others. The STAXI-2 is divided into five subscales: State Anger, Trait Anger, Anger-in, Anger-out, and Anger Control. The present study used the State Anger and Trait Anger subscales. The STAXI-2 had sufficient support for validity from relationships with other measures of anger and hostility (Spielberger, 1999).

State Anger Subscale (SAS). The SAS consists of 10 items that measure a participant's current level of angry feelings (e.g., 'I am furious' or 'I am mad') on a 4-point rating scale (current feelings: 1 = *not at all*; 2 = *somewhat*; 3 = *moderately*; 4 = very much so). The State Anger Scale had good internal consistency (α = .93; Spielberger, 1988) and construct validity (i.e., State Anger Scale scores were found to be reliably predictive of responses to acute behavioral challenges; Kamarack, Manuck, & Jennings, 1990). Items were added into a total, summary score. In the current study, Cronbach's α was .91 for the SAS. The State Anger score was used to statistically control for the current anger-related mood of participants when analyzing hypotheses.

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Trait Anger Subscale (TAS). The TAS is a 10-item measure of global or chronic

tendencies to experience anger. Participants were asked to rate how well an item describes how

he or she feels or reacts (e.g., 'I generally feel I have a fiery temper') on a 4-point scale ranging

from 1 = *almost never* to 4 = *almost always*. The TAS was shown to have strong reliability, α

coefficients ranged from .81 to .91, and adequate test-retest reliability, ranging from $r = .70$ to

.77 (Jacobs, Latham, & Brown, 1988; Spielberger, 1999). Items were added into a total,

summary score that resulted in a Cronbach's α of .85 for the TAS.

Anger Rumination Scale

The Anger Rumination Scale (ARS; Appendix II; Sukhodolsky et al., 2001) is a 19-item

measure of rumination processes in response to anger-provoking experiences. Items involve

continued focus on angry elements, such as 'after an argument is over, I keep fighting with this

person in my imagination', and are rated on a 4-point rating scale (ranged from 1 = *almost never*

to 4 = *almost always*). Sukhodolsky et al. (2001) found that the ARS had adequate convergent

validity, was moderately correlated with subscales of the State-Trait Anger Expression Inventory

(Trait Anger $r = .57$; Anger-In $r = .52$; Anger-Out $r = .43$; Anger-Control $r = .35$), and had

adequate test-retest reliability ($r = .77$). Suhr and Nesbit (2013) demonstrated that the ARS had

relatively high reliability (Chronbach's α ranged from .72 to .90). Cronbach's α for the current

study was .94.

Ruminative Response Scale

The Ruminative response scale (RRS; Appendix III; Treynor et al., 2003) is a 22-item

measure of general rumination and divided into two subscales: reflection and brooding, rated on

a 4-point rating scale (1 = *almost never*; 4 = *almost always*). The Reflection subscale (similar to

concrete rumination) was developed to assess the degree to which individuals intentionally focus

attention inward to alleviate depressive symptoms through problem solving (e.g., 'go away by yourself and think about why you feel this way'). The Brooding subscale (similar to abstract rumination) was developed to assess an individual's passive comparison of their current situation with an unachieved standard (e.g., 'what am I doing to deserve this'). Treynor et al. (2003) reported adequate alpha coefficients for these subscales ranged from .72 to .77 and the rest-retest correlation ranged from $r = .60$ to .62. Cronbach's α estimates for the current study were .95 (total score), .85 (brooding subscale), and .83 (reflective pondering subscale). The RRS was moderately related to measures of depression, trait anxiety, and neuroticism indicating good construct validity (Roelofs, Muris, Huibers, Peeters, & Arntz, 2006).

Social Desirability Scale

The Marlowe-Crowne Social Desirability Scale (MCSDS; Appendix IV; Crowne & Marlowe, 1960) is a 33-item, true/false measure of social desirability and divided into two subscales (Attribution and Denial). Items included assessed if an individual has a tendency to respond in a socially-desirable manner, such as 'I have never intensely disliked anyone' or 'no matter who I'm talking to, I'm always a good listener'. Crowne and Marlowe (1960) reported that the MCSDS had adequate psychometrics including high internal consistency (Chronbach's α of .88) and one month test-retest correlation ($r = .89$). Subsequent research found similar adequate reliability and validity (Beretvas, Meyers, & Leite, 2002; Loo & Thorpe, 2000; Tatman, Swogger, Love, & Cook, 2009). Cronbach's α estimates for the current study were .63 (attribution subscale) and .69 (denial subscale).

Adapted Hostile Attribution Bias Vignettes

The Hostile Attribution Bias Vignettes measure was adapted from Lobbestael, Cima, and Arntz (2013) to improve internal consistency to more acceptable levels (Appendix V). Alpha

coefficients greater than .70 are generally considered acceptable (DeVellis, 2012; Nunnally, 1970, 1978). The original vignettes used by Lobbestael and colleagues consisted of ten vignettes, eight of which were originally borrowed from two previous studies (Cima, Lobbestael, & Vancleef, 2012; Tremblay & Belchevski, 2004). Lobbestael et al. (2013) reported they excluded two of the ten vignettes due to poor hostile interpretation utility (see Appendix VI for the eight remaining vignettes). Vignettes were presented with closed and open answer sections to measure hostile attribution bias. Alpha coefficients for each closed answer options were generally low (negative: α = -.13; positive; α = .52; neutral; α = .63; hostile; α = .76; Lobbestael et al., 2013). *Kappa* estimates between two raters for the open answer section was reportedly high (.95; Lobbestael et al., 2013).

The Hostile Attribution Bias Vignettes measure is a novel and likely useful means to measure hostile attribution bias in a judgment-based manner. The adapted measure for this study included seven items (honed from the eight remaining items used in Lobbestael et al., 2013, eliminating a relatively redundant item), containing short vignettes depicting ambiguously provocative situations. The situations were edited for greater clarity and general plausibility (e.g., more likely to be experienced by more people). For example, the item 'You walk through the street where three boys are playing street hockey' was changed to 'You walk down a street where teenage boys are hanging out'.

Four possible interpretations of each situation were presented and participants were asked to rate the likelihood of those interpretations on a 4-point rating scale (1 = *very unlikely*; 2 = *somewhat unlikely*; 3 = *neutral*; 4 = *somewhat likely*; 5 = *very likely*) with regard to the original four classifications contained in the measure: hostile, negative, positive, and neutral. Four possible interpretations for each of the seven vignettes yielded a total of 28 items that were

presented randomly within the survey. Each set of interpretive responses were added to yield

four scale scores. The four different interpretative responses to the ambiguous situations were

also edited to enhance clarity and general plausibility. Items were added to make up 4 subscales

(hostile, negative, positive, and neutral). Cronbach's α estimates for the current study were .77

for the hostile subscale, .57 for the negative subscale, .58 for the neutral subscale, and .57 for the

positive subscale.

Further, a Principle components factor analysis (described in detail below in the results

section), indicated that only the hostile and negative subscales had utility. While it was justified

to use all seven items in the hostile subscale, the factor analysis indicated that only three items

were represented in the relevant factor for the negative subscale. When including only those

three items, the negative subscale alpha coefficient rose to .70, which justified the use of the

reduced subscale in the present analyses. As the neutral and positive subscales were not of

interest in the original set of hypotheses, they were not included in the present analyses.

Demographics Survey

Each participant completed a short demographic survey (Appendix VII). For example,

some questions assessed sex of the participant, age, and race.

<div align="center">**Data Analyses**</div>

A principle components factor analysis was conducted to assess the factor structure of the

Adapted Hostile Attribution Bias measure. Bivariate correlations were conducted to assess

relationships among all key variables and specific subscales (Hypothesis 1). Two separate

hierarchical, linear regressions were conducted to assess the predictive strength of trait anger

rumination and trait general rumination on hostile attribution bias hostile and negative subscales

(Hypothesis 2). In order to evaluate the relationship between brooding, reflective pondering, and

hostile attribution bias, a hierarchical linear regression was conducted (Hypothesis 3). Both brooding and reflective pondering were entered into the same model to determine if brooding had a stronger relationship with hostile attribution bias. In order to evaluate the potential conditional effect of sex on the association between trait rumination and hostile attribution bias (Hypothesis 4), a macro developed by Hayes (2013) was used to conduct a conditional effect analysis via SPSS (IBM Corp., 2010).

Anger may be one negative emotion that increases the risk of socially desirable response bias. If an individual is currently angry, his or her responses may be more severe than those who are not currently angry. Therefore, both social desirability and state anger were statistically controlled in all hierarchical linear regression analyses.

CHAPTER 4

RESULTS

Preliminary Analyses

Principle components factor analysis

A Principle components factor analysis was conducted to determine if items within the four subscales of the Adapted Hostile Attribution Bias measure distinguished themselves as separate factors. An Eigenvalue cut-off of 1.0 was utilized to initially screen for factors to be examined, as this is a commonly accepted value (Matsunaga, 2010). Eight factors met criteria. However, a visual inspection of the Scree Plot (see Figure 3), showed only the first three factors stood out as distinctive from the rest, where these had Eigenvalues of 5.06, 2.53, and 2.21, respectively. The rest grouped tightly and indistinctly between Eigenvalues of 1.36 and 1.0. Thus, only the first three factors were considered as unique enough to warrant further analysis.
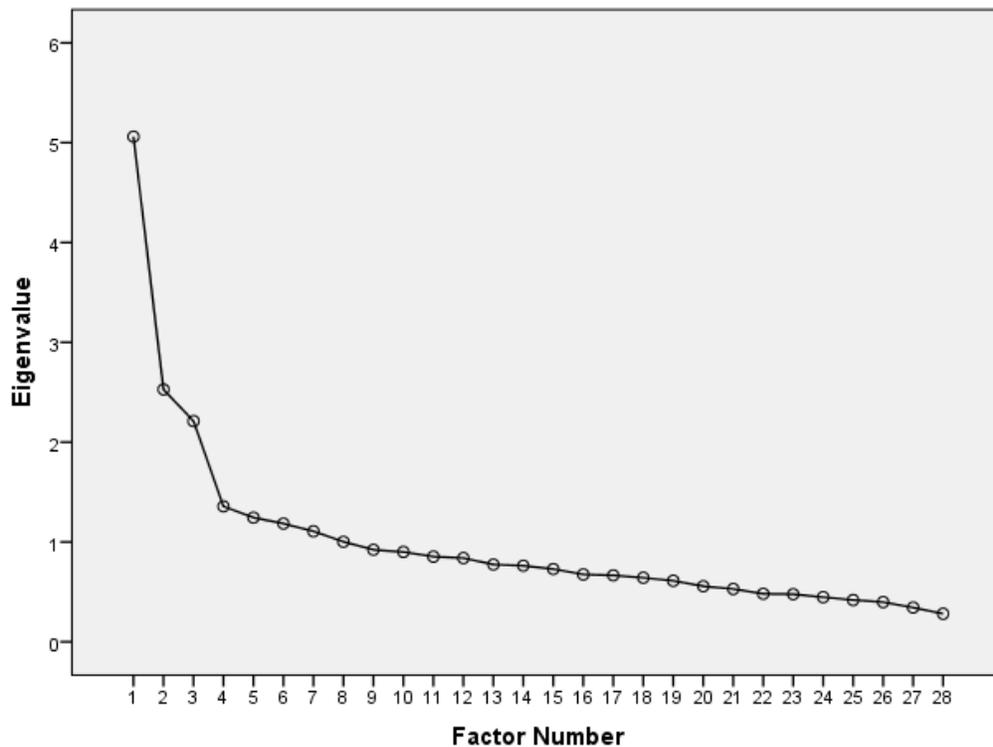
Figure 3. Factor Analytic Scree Plot of Adapted Hostile Attribution Bias Items

Individual item factor loading cut-offs were set at .40, which is generally considered the lowest acceptable threshold (Matsunaga, 2010). The factor-loading values for all items in the first three factors are presented in Table 1. Of the three factors examined, the first was a 'hostile' factor which had the strongest support in terms of constituting a stand-alone subscale, consisting of all seven of the originally conceived hostile-related items. It also contained two negative items (#1 and #6, in the originally conceived negative subscale) at factor loadings of .55 and .56, respectively. As these were not consistent with the originally conceived hostile-related items, and as they were also represented at roughly equal loadings on the third factor (.55 and .57, respectively), they were excluded from the hostile subscale scores.

Table 1. *Factor loadings for the Adapted Hostile Attribution Bias Measure*

| Variable | Components | | |
	1.	2.	3.
AHAB_1hos	*0.57	0.34	-0.12
AHAB_1neg	‡0.55	0.01	*0.55
AHAB_1neu	-0.54	0.09	0.25
AHAB_1pos	-0.60	0.20	0.00
AHAB_2hos	*0.53	0.37	-0.19
AHAB_2neg	0.24	0.21	0.19
AHAB_2neu	-0.45	-0.17	‡0.40
AHAB_2pos	-0.12	*0.48	-0.02
AHAB_3hos	*0.52	0.38	-0.31
AHAB_3neg	0.17	0.17	0.19
AHAB_3neu	-0.33	0.08	‡0.42
AHAB_3pos	-0.40	0.10	0.26
AHAB_4hos	*0.58	0.18	-0.02
AHAB_4neg	0.32	-0.01	*0.52
AHAB_4neu	-0.41	‡0.45	0.01
AHAB_4pos	-0.22	*0.44	0.01
AHAB_5hos	*0.48	0.38	-0.30
AHAB_5neg	-0.21	0.14	0.36
AHAB_5neu	-0.15	0.24	0.28
AHAB_5pos	-0.24	*0.41	0.14
AHAB_6hos	*0.64	0.26	0.15
AHAB_6neg	‡0.56	-0.04	*0.57
AHAB_6neu	-0.35	‡0.41	0.05
AHAB_6pos	-0.53	0.16	-0.03
AHAB_7hos	*0.51	0.09	‡0.43
AHAB_7neg	0.08	0.35	0.29
AHAB_7neu	-0.49	‡0.41	0.05
AHAB_7pos	-0.13	*0.59	-0.17

Note. $N = 371$. AHAB_Neg=Adapted Hostile Attribution Bias Negative Subscale; AHAB_Neu=Adapted Hostile Attribution Bias Neutral Subscale; AHAB_Hos=Adapted Hostile Attribution Bias Hostile Subscale; AHAB_Pos=Adapted Hostile Attribution Bias Positive Subscale. *Items of consistent representation from originally conceived subscales. ‡ Items of inconsistent representation from originally conceived subscales.

The second factor had seven items meeting the .40 threshold, but these items were mixed in content, with four positive and three neutral items. Thus, there was no clear interpretation of this factor, casting doubt on their utility as independent subscales. Items from these positive and neutral subscales were not included in the original hypotheses.

The third factor did present interpretation problems, as it consisted of six items meeting the .40 loading threshold, where three were negative, two were neutral, and one was hostile. The latter hostile item (#7) was more strongly represented in the first factor (.51 vs. .43) in which it was also consistent with originally conceived items; therefore, it was thus included in the hostile subscale scores. When ignoring the hostile and the two neutral items, the three negative subscale items within the third factor, yielded an alpha coefficient of .70, indicating a likely utility for including the negative subscale with this reduced number of items.

Analysis of variance analyses

ANOVAs were conducted to determine if there were significant differences between participants excluded, based on time and missing data, and included in the primary analyses. Results of the ANOVAs indicated that there were significant differences between the excluded and included participants for the following variables: Anger Rumination Scale ($F(1,488) = 5.86$, $p = .02$, $\eta^2 = .01$); State Anger Subscale ($F(1,495) = 97.99$, $p < .001$, $\eta^2 = .17$); Trait Anger Subscale ($F(1,489) = 5.89$, $p = .02$, $\eta^2 = .01$); Social Desirability Attribution Subscale ($F(1,502)$ $= 237.09$, $p < .001$, $\eta^2 = .32$); Hostile Attribution Bias Hostile Subscale ($F(1,492) = 86.49$, $p <$ $.001$, $\eta^2 = .15$); Hostile Attribution Bias Positive Subscale ($F(1,493) = 53.393$, $p < .001$, $\eta^2 =$ $.10$); Hostile Attribution Bias Negative Subscale ($F(1,497) = 11.26$, $p < .01$, $\eta^2 = 02$); Hostile Attribution Bias Neutral Subscale ($F(1,493) = 227.06$, $p < .001$, $\eta^2 = .32$). No significant differences between excluded and included participants were found for Ruminative Response

Scale ($F(1,492) = .13$, $p = .72$, $\eta^2 < .001$); Brooding Subscale ($F(1,489) = .16$, $p = .69$, $\eta^2 < .001$); Reflective Pondering Subscale ($F(1,490) = .62$, $p = .43$, $\eta^2 < .01$); or the Anger Expression Inventory ($F(1,496) = 0.53$, $p = .47$, $\eta^2 < .01$). It appeared for many of these scales, the excluded participants had higher mean scores than included participants; however, this may have been due to increased chance of random or dishonest responding. Due to the potential for invalid or unreliable responding in excluded participants, all primary analyses were conducted using the participants who did not meet exclusion criteria.

Relationships Among Variables

Bivariate correlations, internal consistency estimates, and descriptive statistics for the main variables of interest are presented in Table 2. Trait anger scores were significantly and positively correlated with trait rumination scores, as measured by both the Ruminative Response Scale ($r = .38$, $p < .01$) and Anger Rumination Scale ($r = .58$, $p < .01$), lending support to Hypothesis 1.

Hypothesis 2 was supported; anger rumination scores significantly predicted hostile interpretation subscale scores, controlling for state anger and social desirability attribution scores (Table 3). Anger rumination scores significantly predicted negative interpretation subscale scores, controlling for state anger and social desirability attribution scores (Table 4). General rumination scores significantly predicted hostile interpretation subscale scores, controlling for state anger and social desirability attribution scores (Table 5). General rumination scores significantly predicted negative interpretation subscale scores, controlling for state anger and social desirability attribution scores (Table 6).

Table 2. *Descriptive Statistics and Bivariate Correlations*

Variable	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. RRS	47.89	15.59	(.95)											
2. RRS_B	11.44	4.01	.89**	(.85)										
3. RRS_R	10.26	3.92	.86**	.67**	(.83)									
4. ARS	38.43	12.72	.58**	.55**	.51**	(.94)								
5. SDS_Att	25.25	2.96	.12*	.12*	.03	.22**	(.63)							
6. SAS	11.99	4.17	.32**	.27**	.28**	.31**	-.01	(.91)						
7. TAS	19.69	5.76	.38**	.36**	.31**	.58**	.22**	.33**	(.85)					
8. AES	57.89	6.77	.33**	.29**	.26**	.34**	.03	.07	.23**	(.57)				
9. AHAB_Hos	14.62	4.97	.26**	.29**	.21**	.27**	-.03	.27**	.26**	.11**	(.77)			
10. AHAB_Neg	9.36	2.86	.36**	.35**	.25**	.33**	.18**	.11*	.25**	.22**	.40**	(.57)		
11. AHAB_Neu	25.59	4.35	-.09	-.11*	-.04	-.10*	-.05	-.16**	-.20**	.01	-.43*	-.18**	(.58)	
12. AHAB_Pos	22.60	4.39	-.13*	-.14**	-.07	-.15**	-.25**	-.11*	-.20**	-.04	-.21**	-.31**	.55**	(.57)

Note. *N* = 371. Figures in parentheses are α coefficients. RRS=Ruminative Response Scale; RRS_B=Brooding Subscale; RRS_R=Reflective Pondering Subscale; ARS=Anger Rumination Scale; SDS=Social Desirability Attribution Subscale; SAS=State Anger Subscale; TAS=Trait Anger Subscale; AES=Anger Expression Scale; AHAB_Hos=Adapted Hostile Attribution Bias Hostile Subscale; AHAB_Neg=Adapted Hostile Attribution Bias Negative Subscale; AHAB_Neu=Adapted Hostile Attribution Bias Neutral Subscale; AHAB_Pos=Adapted Hostile Attribution Bias Positive Subscale.
*p < .05, **p<.01

Table 3.
Hierarchical Regression Analysis Summary for Trait Anger
Rumination Predicting Hostile Interpretations

Variable	B	SD	t	p-value
Model 1				
Social Desirability	-.27	.07	-4.13	< .001
State Anger	.25	.04	5.92	< .001
Model 2				
Social Desirability	-.30	.06	-4.67	< .001
State Anger	.18	.04	4.11	< .001
Anger Rumination	.09	.02	4.62	< .001

Note. Model 1 $R^2 = .13$; $\Delta R^2 = .13$; Model 2 $R^2 = .16$; $\Delta R^2 = .04$;
Collinearity Statistic Tolerance for Anger Rumination= .88

Table 4.
Hierarchical Regression Analysis Summary for Trait Anger
Rumination Predicting Negative Interpretations

Variable	B	SD	t	p-value
Model 1				
Social Desirability	.14	.04	4.14	< .001
State Anger	.04	.02	1.95	.05
Model 2				
Social Desirability	.13	.03	3.69	< .001
State Anger	.00	.02	.08	.94
Anger Rumination	.05	.01	5.32	< .001

Note. Model 1 $R^2 = .04$; $\Delta R^2 = .04$; Model 2 $R^2 = .09$; $\Delta R^2 = .05$;
Collinearity Statistic Tolerance for Anger Rumination = .88

Table 5.
Hierarchical Regression Analysis Summary for Trait General Rumination Predicting Hostile Interpretations

Variable	B	SD	t	p-value
Model 1				
Social Desirability	-.27	.07	-4.17	$< .001$
State Anger	.25	.04	5.98	$< .001$
Model 2				
Social Desirability	-.29	.06	-4.55	$< .001$
State Anger	.20	.04	4.57	$< .001$
General Rumination	.06	.02	3.64	$< .001$

Note. Model 1 $R^2 = .13$; $\Delta R^2 = .13$; Model 2 $R^2 = .15$; $\Delta R^2 = .02$; Collinearity Statistic Tolerance for General Rumination = .90

Table 6.
Hierarchical Regression Analysis Summary for Trait General Rumination Predicting Negative Interpretations

Variable	B	SD	t	p-value
Model 1				
Social Desirability	.14	.04	4.14	$< .001$
State Anger	.04	.02	1.99	.05
Model 2				
Social Desirability	.12	.03	3.64	$< .001$
State Anger	-.01	.02	-.21	.83
General Rumination	.05	.01	6.71	$< .001$

Note. Model 1 $R^2 = .04$; $\Delta R^2 = .04$; Model 2 $R^2 = .12$; $\Delta R^2 = .08$; Collinearity Statistic Tolerance for General Rumination = .90

Both brooding and reflective pondering scores were simultaneously entered into the regression equation (and controlling for state anger and social desirability attribution scores), to examine whether brooding exhibited stronger relationships with hostile attribution bias compared to reflective pondering. Lending support to Hypothesis 3, the brooding subscale scores significantly predicted hostile interpretation subscale scores, while the reflective pondering subscale scores did not significantly predict hostile attribution bias (Table 7). Also included in the model was state anger, which was significant, and social desirability, which was non-significant.

Table 7.
Hierarchical Regression Analysis Summary for Brooding and Reflective Pondering Predicting Hostile Interpretations

Variable	B	SD	t	p-value
Model 1				
Social Desirability	-.28	.07	-4.25	< .001
State Anger	.25	.04	5.90	< .001
Model 2				
Social Desirability	-.31	.07	-4.76	< .001
State Anger	.21	.04	4.73	< .001
Brooding	.28	.08	3.34	< .01
Reflective Pondering	-.04	.08	-.50	.62

Note. Model 1 R^2 = .13; ΔR^2 = .13; Model 2 R^2 = .16; ΔR^2 = .03; Collinearity Statistic Tolerance for Brooding = .93; Collinearity Statistic Tolerance for Reflective Pondering = .92

Conditional Effect Analyses

The full model regression model was significant ($F(5,365)$ = 10.25, $p < .001$, R^2 = .12). Trait anger rumination was significantly related to the hostile subscale of the Adapted Hostile Attribution Bias measure ($t(365)$ = 3.15, $p < .01$, b = .08, SE = .03); however, neither sex ($t(365)$ = -.48, p = .63, b = -.78, SE = 1.63) nor the interaction between sex and trait anger rumination ($t(365)$ = .85, p = .39, b = .04, SE = .04) were significant. Hypothesis 4 was thus not supported

because conditional effects of trait anger rumination on hostile attribution bias, based on sex, were not significant.

Exploratory Analyses

Given commonly observed sex differences in previous studies (i.e., basis for Hypothesis 4), exploratory ANOVA analyses were conducted to examine the non-significant results for effects of trait anger rumination scores on hostile interpretation subscale scores conditional to the sex of the participant. Results of the exploratory ANOVAs indicated that there were no significant differences between the males and females for the Anger Rumination Scale ($F(1,370) = 3.11$, $p = .08$, $\eta^2 = .01$); State Anger Subscale ($F(1,370) = 0.11$, $p = .74$, $\eta^2 < .01$); Trait Anger Subscale ($F(1,370) = 0.73$, $p = .40$, $\eta^2 < .01$); or the Hostile Attribution Bias Hostile Subscale ($F(1,370) = 0.44$, $p = .51$, $\eta^2 < .01$). Interestingly, significant differences for sex were found for the Social Desirability Scale ($F(1,370) = 5,97$, $p = .02$, $\eta^2 = .02$), as females reported more social desirability bias than males (female $M = 25.50$, $SD = 2.96$; male $M = 24.69$, $SD = 2.89$).

CHAPTER 5

DISCUSSION

According to the ICM, hostile interpretation biases are hypothesized to influence anger in two different ways: 1) some individuals are more vigilant to recognizing and processing hostile information or 2) some individuals have pre-existing hostile interpretations that are reinforced (Wilkowski & Robinson, 2008, 2010). Many previous studies that utilized experimental methodologies with visual search tasks suggested that high trait anger individuals are able to identify hostile words more quickly and tend to interpret ambiguous situations as more hostile compared to low trait anger individuals (e.g., Putman et al., 2004; Smith & Waterman, 2003, 2004, Wilkowski et al., 2007). Few studies tested the ICM's second hypothesis with a more direct link between trait rumination and hostile interpretation biases (e.g., Bushman, 2002). The current study supports and builds upon the ICM, such that individuals high in trait rumination (i.e., more prone to experiencing pre-existing hostile interpretations) are more likely to experience hostile attribution bias in ambiguous situations.

The current research study supported usage for a hostile attribution bias measure in survey-based studies as well as observed the relationships between trait rumination, trait anger, and hostile attribution bias. This author examined conditional effects of sex on hostile attribution bias. The adapted hostile attribution bias measure had significantly improved psychometrics and appeared to be a fairly reliable method in assessing hostile attribution bias (i.e., hostile interpretations), though only the hostile and negative subscales had adequate reliability ($\alpha > .70$). A closer examination of the measure via a confirmatory factor analysis revealed that the 'hostile' subscale was the most valid and useful. The 'positive' and 'neutral' subscales, and to a lesser

extent the 'negative' subscale, were less reliable and effective in measuring non-hostile factors that may have been used as alternative interpretations and comparison to the 'hostile' subscale.

As expected, trait anger was significantly and positively related to trait rumination, though anger rumination had a stronger relationship with trait anger ($r = .58$) compared to trait general rumination ($r = .38$). The differences between the correlation coefficients for anger rumination and general rumination were statistically significant ($z = 3.56$; $p < .001$). Anger rumination may have been more strongly associated with trait anger due to shared variance related to an underlying anger construct. These results were consistent with previous studies suggesting that individuals high in trait anger have a tendency to angrily ruminate more often than those with low trait anger (e.g., Wilkowski et al., 2007). According to the ICM, those with higher trait anger will focus on the anger-provoking event (i.e., ruminate on it), exacerbating and prolonging an angry mood state and putting the individual at higher risk of engaging in aggressive behaviors (Wilkowski & Robinson, 2008, 2010).

Further, the Wilkowski and colleagues posit in the ICM that there are many cognitive factors that influence anger in addition to rumination, one of which is called hostile attribution bias (Wilkowski & Robinson, 2008, 2010). The current study supported the conclusion that rumination scores significantly predicted hostile and negative interpretations of ambiguous situations adapted from vignettes used in previous research (Lobbestael et al., 2013). Individuals high in trait general rumination, as well as specifically, trait anger rumination had a tendency to perceive ambiguous situations as hostile or negative, suggesting that they are more likely to experience hostile attribution bias compared to individuals low in trait anger rumination. Rumination was a unique predictor of this bias toward a hostile perception, even when controlling for current angry mood state or positive response bias.

Though historically, many studies describe rumination as a maladaptive cognitive process that exacerbates or prolongs emotional experiences (e.g., depression, anxiety, or anger), it can also have advantages for processing information and be adaptive to alleviating negative emotions (Treynor et al., 2003). The more common maladaptive type of rumination, called brooding, is characterized by a focus on the causes of negative symptoms or 'why' the individual feels the way they do, while a more adaptive rumination is called reflective pondering. Reflective pondering occurs when an individual consistently focuses on 'how' an emotional event occurs or aspects the individual can change to alleviate negative symptoms.

In the current study, brooding was significantly more predictive of hostile attribution bias compared to reflective pondering, so much so that reflective pondering was not a significant predictor. According to Treynor and colleagues, brooding is more maladaptive than its reflective pondering because individuals engaging in this type of cognitive process tends to focus on aspects of a situation that are beyond their control, which may lead to more negative interpretations of the provoking event, leading to prolonged and exacerbated emotional experiences (Treynor et al., 2003). Results from the current study were consistent with Bushman's (2002) findings, in which anger rumination was linked to increased likelihood of an individual automatically interpreting a situation as hostile. It may be that when an individual continuously ruminates about 'why' an event occurs as well as the symptoms and causes of a negative emotional response, a type of priming effect for hostile interpretations is more likely to occur. Upon interpreting the situation as hostile, the individual may ruminate further about the triggering events and feel angrier or potentially aggressive.

Many studies have previously found that males tend to report more anger and engage in anger rumination more often than females (e.g., Bushman, 2002), while females tend to report

more depression or depressive rumination (e.g., Watkins, 2004). Thus, it was expected that trait anger rumination would be more predictive of hostile attribution bias in males compared to females. However, conditional effects of sex of the participant were not significant in the current study. Exploratory analyses confirmed there were no significant sex differences observed in trait anger rumination, trait anger, and hostile attribution bias; however, significant differences were found for social desirability with females scoring higher than males on the Social Desirability Scale. The non-significant results for conditional effects of sex may have been due to uneven sample sizes for males and females, as there were over twice as many females in the current sample; however, only sixty-seven males were excluded from the original sample for taking the surveys in a short period of time or declining to answer many of the items. Power analyses indicated there was sufficient power (power > .99) to detect sex differences, if they were present, independent from the exclusion of those sixty-seven males.

Limitations

All cognitive and emotional processes were predominately self-report and trait-based in nature and measured via surveys online, rather than observable behaviors at multiple points in time. Some researchers have found that certain cognitive processes or behaviors are only available during an active emotional state (e.g., Tice & Baumeister, 1993). Individuals who experience anger and rumination in the moment may perceive and respond differently to ambiguous situations compared to those presented in vignettes. Measuring anger-related thoughts or behaviors via self-report allows participants to potentially present themselves in more socially-desirable ways. Though the current study attempted to control for this with a social desirability measure, methodologies that utilize immediate observation or provocation of

emotional states may allow for more objective results of anger, anger rumination, and hostile attribution bias.

The cross-sectional design of the study may also reduce conclusions that can be made based on the results. Some limitations of cross-sectional designs are related to determining directionality and cause-and-effect. For example, the current study found support for a relationship between trait rumination and hostile interpretations; however, the direction of the relationship cannot be determined without more experimental methodologies. In addition, cause-and-effect conclusions cannot be made with a cross-sectional design. In other words, future studies may utilize more experimental methods to determine if rumination 'causes' hostile interpretations in high trait anger individuals.

Another potential limitation to the current results is related to the sample. Participants were largely recruited from a southern university and may not represent the population in other geographical locations or non-college settings. In addition, preliminary results found that individuals who were excluded from the study reported more trait anger rumination, state or trait anger, and hostile attribution bias. Participants who took the surveys in a short-amount of time may have randomly or dishonestly responded, potentially resulting in inaccurate information regarding their actual experience with anger, rumination, and hostile interpretations. In addition, participants who declined to answer 75% or more of the items were excluded from the analyses, as they may have responded in an inconsistent manner. Some of the measures used in this study had a limited number of items, such that any missing data (i.e., participants declining to answer any given item), may significantly reduce the reliability of the measures and increase the likelihood of inaccurate data. The sample used in this research may under-represent anger in the population due to excluding the most trait angry individuals most prone to anger rumination and

hostile attribution bias. The extent to which the sample is not representative of anger in the population may be small due to the excluded group also being the most likely to be randomly respond, answer in a way that may be more dishonest, or have low frustration tolerance while completing the surveys.

As seen in Tables 3-7, there was relatively high amount of collinearity (greater than .80) between trait anger and general rumination with state anger, social desirability, and hostile and negative interpretations. High amount of collinearity suggests there may have been some shared variance between the variables, in turn over-representing the strength of the relationships among the variables. However, relationships among these variables was expected due to some of the variables (e.g., anger rumination, state anger, or hostile interpretations) measuring similar constructs of anger. Correlation coefficients for hostile interpretations (i.e., the hostile subscale of the AHAB) with both anger rumination ($r = .27$) and state anger ($r = .27$) were small, suggesting each variable may measure unique aspects of anger not accounted for in other measures.

Implications

Results from the current study provide evidence for the predictive qualities of trait anger rumination and brooding on hostile attribution bias. Further, results provide a self-report measure of hostile attribution bias that has great utility for survey-based research. Those prone to rumination may be more likely to perceive situations as hostile, in turn potentially priming the individual for anger and aggressive behaviors. Reducing rumination and increasing executive functioning and reappraisal processes may decrease hostile attribution bias and risk of aggressive behaviors. In other words, rumination may be targeted as a treatment goal to reduce the impact of anger in rumination- and anger-prone individuals.

Reappraisal and distraction were found to be effective techniques in reducing rumination with small to moderate effect sizes (Denson et al., 2012b), while anger treatments related to cognitive restructuring and relaxation had moderate effect sizes (Edmondson & Conger, 1996). Recognizing triggers to rumination and anger as well as indicators of when an individual is ruminating in the moment may help reduce hostile attribution bias before it exacerbates the anger experience. For example, if an individual is able to recognize when he or she is ruminating early in the process, reappraisal processes may be more readily activated. Attention may then be directed toward non-hostile information in the triggering event to reduce hostile perceptions.

Future Directions

Future research may further our understanding of rumination and hostile attribution bias through more objective, experimental methods. More objective methodologies, such as having an individual actively ruminate after provocation and measure immediate perceptions in live, simulated ambiguously hostile situations, may be beneficial. In addition, priming effects of rumination on anger may also be helpful to observe whether hostile attribution bias is stronger in those primed to ruminate. Future studies may also potentially improve upon and further strengthen the psychometric properties of the adapted hostile attribution bias measure.

Conclusion

Understanding the role of rumination in anger and hostile attribution bias processes was expanded with the present study. Previous research has focused on the relationship between trait anger and hostile attribution bias; however, many studies used visual search tasks to measure hostile attribution bias, such as a searching for hostile words using variations of a spatial probe task (e.g.,Smith & Waterman, 2003, 2004), searching for angry facial expressions (Putman, Hermans, & van Honk, 2004), or using a Stroop task (Williams, Mathews, & MacLeod, 1996).

Another study by Wilkowski et al. (2007) utilized eye-tracking software that provided further evidence of the relationship between hostile attribution bias and trait anger.

Despite the various visual stimuli-dependent methods to measuring hostile attribution bias, Wilkowski and Robinson (2008) suggested that using such visual search tasks to measure hostile attribution bias may be problematic due to the stimuli bearing little resemblance to daily life encounters. In addition, VanRullen and colleagues found that many individuals tend to extract "gist" interpretations prior to attending to specific stimuli within any given situation (e.g., VanRullen & Thorne, 2011). Other research on trait anger focused on its relationship to trait rumination (e.g., Berry et al., 2005; Siewert et al., 2011; Sukhodolsky et al., 2001) or examined state anger and rumination (Bushman, 2002), yet these studies lacked direct measures of hostile attribution bias.

The current study provided an adapted self-report measure of hostile attribution bias was shown to be a reliable tool for survey-based research. The adapted hostile attribution bias measure addressed some of the limitations of other visually-dependent measures utilized in previous research. The adapted hostile attribution bias measure, supported here, utilized vignettes that described a variety of real-life scenarios. Results from the current study provided evidence of a direct relationship between trait rumination (i.e., general and anger specific) and hostile attribution bias, while trait rumination did not exhibit significant effects on hostile attribution bias based on gender. In other words, male and females who reported more trait rumination were equally likely to experience hostile attribution bias. A more maladaptive-type of rumination, called brooding, was found to be more predictive of hostile attribution bias than its more adaptive counter-part, reflective pondering.

Results found in this study contribute to our understanding of anger and rumination and were consistent with the Integrative Cognitive Model of anger; individuals prone to ruminate are more likely to perceive ambiguous situations as more hostile. Future studies may utilize the adapted hostile attribution bias measure in conjunction with experimental methods (e.g., inducing individuals to ruminate or distract and/or provoke anger) to observe whether the results presented in this study are externally valid. It may be the case that individuals who are angry and actively ruminate are even more prone to hostile attribution bias. In addition, future studies may examine ways to reduce an individual's risk of ruminating and engaging in subsequent hostile perceptions in ambiguously hostile situations.

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Appendix A

State-Trait Anger Expression Inventory

Directions: A number of statements people use to describe themselves are given below. Read

each statement and then circle the number which indicates how you feel **right now**. Remember

there are no right or wrong answers. Do not spend too much time on any one statement, but give

the answer which seems to best describe your **present feelings**.

How I Feel Right Now

	Not At All	**Somewhat**	**Moderately**	**Very Much So**
1) I am furious.	1	2	3	4
2) I feel irritated.	1	2	3	4
3) I feel angry.	1	2	3	4
4) I feel like yelling at somebody.	1	2	3	4
5) I feel like breaking things.	1	2	3	4
6) I am mad.	1	2	3	4
7) I feel like banging on the table.	1	2	3	4
8) I feel like hitting someone.	1	2	3	4
9) I am burned up.	1	2	3	4

10) I feel like

swearing.	1	2	3	4

Directions: A number of statements people use to describe themselves are given below. Read each statement and then circle the number which indicates how you **generally feel**. Remember there are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to best describe **how you generally feel**.

How I Generally Feel

	Almost Never	Sometimes	Often	Almost Always
11) I am quick tempered.	1	2	3	4
12) I have a fiery temper.	1	2	3	4
13) I am a hotheaded person.	1	2	3	4
14) I get angry when I'm slowed down by others' mistakes.	1	2	3	4
15) I feel annoyed when I am not given recognition for doing good work.	1	2	3	4
16) I fly off the handle.	1	2	3	4
17) When I get mad, I say nasty things.	1	2	3	4
18) It makes me furious when I am criticized in front of others.	1	2	3	4

19) When I get frustrated, I

   feel like hitting someone. 1   2   3   4

20) I feel infuriated when I

   do a good job and get a

   poor evaluation.   1   2   3   4

Directions: Everyone feels angry or furious from time to time, but people differ in the ways that they react when they are angry. A number of statements are listed below which people use to describe their reactions when they feel **angry or furious**. Read each statement and then circle the number which indicates **how often you generally react or behave** in the manner described **when you are feeling angry or furious**. Remember that there are no right or wrong answers. Do not spend too much time on any one statement.

When Angry Or Furious…

	Almost Never	**Sometimes**	**Often**	**Almost Always**
21) I control my temper.	1	2	3	4
22) I express my anger.	1	2	3	4
23) I keep things in.	1	2	3	4
24) I am patient with others.	1	2	3	4
25) I pout or sulk.	1	2	3	4
26) I withdraw from people.	1	2	3	4
27) I make sarcastic remarks to others.	1	2	3	4
28) I keep my cool.	1	2	3	4

29) I do things like slam doors.   1   2   3   4

30) I boil inside, but I don't

   show it.   1   2   3   4

31) I control my behavior.   1   2   3   4

32) I argue with others.   1   2   3   4

33) I tend to harbor grudges

   that I don't tell anyone

   about.   1   2   3   4

34) I strike out at whatever

   infuriates me.   1   2   3   4

35) I can stop myself from

   losing my temper.   1   2   3   4

36) I am secretly quite

   critical of others.   1   2   3   4

37) I am angrier than I am

   willing to admit.   1   2   3   4

38) I calm down faster than

   most other people.   1   2   3   4

39) I say nasty things.   1   2   3   4

40) I try to be tolerant and

   understanding.   1   2   3   4

41) I'm irritated a great deal

   more than people are

aware of.	1	2	3	4
42) I lose my temper.	1	2	3	4

43) If someone annoys me,

I'm apt to tell him or her

how I feel.	1	2	3	4
44) I control my angry feelings.	1	2	3	4

Appendix B

Anger Rumination Scale

Directions: Please read through the items below and select how frequently you engage in the following:

1. I ruminate about my past anger experiences

1----------------2--------------3-------------4

Almost Never   Almost Always

2. I ponder about the injustices that have been done to me

1----------------2--------------3--------------4

       Almost Never   Almost Always

3. I keep thinking about events that angered me for a long time

1----------------2--------------3--------------4

   Almost Never   Almost Always

4. I have long living fantasies of revenge after the conflict is over

1----------------2--------------3--------------4

Almost Never   Almost Always

5. I think about certain events from a long time ago and they still make me angry

1----------------2--------------3--------------4

Almost Never   Almost Always

6. I have difficulty forgiving people who have hurt me

1----------------2--------------3--------------4

Almost Never   Almost Always

7. After an argument is over, I keep fighting with this person in my imagination

1----------------2--------------3--------------4

Almost Never   Almost Always

8.   Memories of being aggravated pop up into my mind before I fall asleep

1----------------2--------------3--------------4

Almost Never   Almost Always

9.   Whenever I experience anger, I keep thinking about it for a while

1----------------2--------------3--------------4

Almost Never   Almost Always

10. I have had times when I could not stop being preoccupied with a particular conflict

1----------------2--------------3--------------4

Almost Never   Almost Always

11. I analyze events that make me angry

1----------------2--------------3--------------4

Almost Never   Almost Always

12. I think about the reasons people treat me badly

1----------------2--------------3--------------4

Almost Never   Almost Always

13. I have day dreams and fantasies of violent nature

1----------------2--------------3--------------4

Almost Never   Almost Always

14. I feel angry about certain things in my life

1----------------2--------------3--------------4

Almost Never   Almost Always

15. When someone makes me angry I can't stop thinking about how to get back at this person

1----------------2--------------3--------------4

Almost Never   Almost Always

16. When someone provokes me, I keep wondering why this should have happened to me

1----------------2--------------3--------------4

Almost Never   Almost Always

17. Memories of even minor annoyances bother me for a while

1----------------2--------------3--------------4

Almost Never   Almost Always

18. When something makes me angry, I turn this matter over and over again in my mind

1----------------2--------------3--------------4

Almost Never   Almost Always

19. I re-enact the anger episode in my mind after it has happened

1----------------2--------------3--------------4

Almost Never   Almost Always

Appendix C

Ruminative Response Scale

Directions: Please read through the items below and select how frequently you engage in the following:

1. Think about how alone you feel

1----------------2--------------3--------------4

Almost Never   Almost Always

2. Think "I won't be able to do my job if I don't snap out of this."

1----------------2--------------3--------------4

Almost Never   Almost Always

3. Think about your feelings of fatigue and achiness

1----------------2--------------3--------------4

Almost Never   Almost Always

4. Think about how hard it is to concentrate

1----------------2--------------3--------------4

Almost Never   Almost Always

5. Think "What am I doing to deserve this?"

1----------------2--------------3--------------4

Almost Never   Almost Always

6. Think about how passive and unmotivated you feel

1----------------2--------------3--------------4

Almost Never   Almost Always

7. Analyze recent events to try to understand why you are depressed

1----------------2--------------3--------------4

Almost Never   Almost Always

8. Think about how you don't seem to feel anything anymore

1----------------2--------------3--------------4

Almost Never   Almost Always

9. Think "Why can't I get going?"

1----------------2--------------3--------------4

Almost Never   Almost Always

10. Think "Why do I always react this way?"

1----------------2--------------3--------------4

Almost Never   Almost Always

11. Go away by yourself and think about why you feel this way

1----------------2--------------3--------------4

Almost Never   Almost Always

12. Write down what you are thinking and analyze it

1----------------2--------------3--------------4

Almost Never   Almost Always

13. Think about a recent situation, wishing it had gone better

1----------------2--------------3--------------4

Almost Never   Almost Always

14. Think "I won't be able to concentrate if I keep feeling this way."

1----------------2--------------3--------------4

Almost Never   Almost Always

15. Think "Why do I have problems other people don't have?"

1----------------2--------------3--------------4

Almost Never   Almost Always

16. Think "Why can't I handle things better?"

1----------------2--------------3--------------4

Almost Never   Almost Always

17. Think about how sad you feel

1----------------2--------------3--------------4

Almost Never   Almost Always

18. Think about all your shortcomings, failings, faults, mistakes

1----------------2--------------3--------------4

Almost Never   Almost Always

19. Think about how you don't feel up to doing anything

1----------------2--------------3--------------4

Almost Never   Almost Always

20. Analyze your personality to try to understand why you are depressed

1----------------2--------------3--------------4

Almost Never   Almost Always

21. Go someplace alone to think about your feelings

1----------------2--------------3--------------4

Almost Never   Almost Always

22. Think about how angry you are with yourself

1----------------2--------------3--------------4

Almost Never   Almost Always

Appendix D

Marlowe-Crowne Social Desirability Scale

Directions: Read each item and decide whether it is true (T) or false (F) for you. Try to work rapidly and answer each question by clicking on the T or the F.

1. T F Before voting I thoroughly investigate the qualifications of all the candidates.

2. T F I never hesitate to go out of my way to help someone in trouble.

3. T F It is sometimes hard for me to go on with my work if I am not encouraged.

4. T F I have never intensely disliked anyone.

5. T F On occasions I have had doubts about my ability to succeed in life.

6. T F I sometimes feel resentful when I don't get my way.

7. T F I am always careful about my manner of dress.

8. T F My table manners at home are as good as when I eat out in a restaurant.

9. T F If I could get into a movie without paying and be sure I was not seen, I would probably do it.

10. T F On a few occasions, I have given up something because I thought too little of my ability.

11. T F I like to gossip at times.

12. T F There have been times when I felt like rebelling against people in authority even though I knew they were right.

13. T F No matter who I'm talking to, I'm always a good listener.

14. T F I can remember "playing sick" to get out of something.

15. T F There have been occasions when I have taken advantage of someone.

16. T F I'm always willing to admit it when I make a mistake.

17. T F I always try to practice what I preach.

18. T F I don't find it particularly difficult to get along with loudmouthed, obnoxious people.

19. T F I sometimes try to get even rather than forgive and forget.

20. T F When I don't know something I don't mind at all admitting it.

21. T F I am always courteous, even to people who are disagreeable.

22. T F At times I have really insisted on having things my own way.

23. T F There have been occasions when I felt like smashing things.

24. T F I would never think of letting someone else be punished for my wrong-doings.

25. T F I never resent being asked to return a favor.

26. T F I have never been irked when people expressed ideas very different from my own.

27. T F I never make a long trip without checking the safety of my car.

28. T F There have been times when I was quite jealous of the good fortune of others.

29. T F I have almost never felt the urge to tell someone off.

30. T F I am sometimes irritated by people who ask favors of me.

31. T F I have never felt that I was punished without cause.

32. T F I sometimes think when people have a misfortune they only got what they deserved.

33. T F I have never deliberately said something that hurt someone's feelings.

Appendix E

Adapted Hostile Attribution Bias Vignettes

You will read a number of short descriptions of situations. We then present you with a possible

interpretation of each situation and ask you to rate the likelihood those interpretations.

Very Unlikely   Somewhat Unlikely   Neutral   Somewhat Likely   Very Likely

1.   You walk down a street where teenage boys are hanging out. As you pass them, you hear

them laugh. How likely is it that:

   a. They were laughing at you (Negative)

   b. They were joking amongst themselves (Neutral)

   c. They are trying to provoke a fight with you (Hostile)

   d. They laugh because they are happy (Positive)

2.   You are at a club or bar, and a large man bumps into you from behind. How likely is it that:

   a. He did this to provoke a conflict (Hostile)

   b. He was not looking where he was going and it happened by accident

   (Neutral)

   c. The man was not very friendly and just didn't care whom he bumped

   (Negative)

   d. The man was trying to be friendly and get your attention, but tripped

   (Positive)

3.   Kids are playing ball outside your home. The next thing you know your window has been

broken. How likely is it that:

   a. These kids are just careless and irresponsible (Negative)

b.   These kids remind you that everyone makes mistakes and you forgive them (Positive)

c.   These kids were trying to damage your property on purpose (Hostile)

d.   These kids just needed a better place to play ball (Neutral)

4.   Your friends go out for lunch without asking you. How likely is it that:

a.   They just don't want you to go with them this time (Negative)

b.   They are intentionally trying to hurt your feelings (Hostile)

c.   They know I just don't like that particular restaurant (Positive)

d.   They probably thought I already had other plans (Neutral)

5.   Your car was towed and when you go to pick it up, you notice a dent in the side that you had not seen before. How likely is it that:

a.   The tow truck driver dented it on purpose (Hostile)

b.   The dent was already there, and you are glad you noticed now so you can get it fixed (Positive)

c.   You can't determine whether or not it was there before it was towed (Neutral)

d.   It was accidentally dented during the tow, but the driver didn't notice (Negative)

6.   You are walking in a crowd. You notice a group of people is talking loud and pointing in your direction. How likely is it that:

a.   They are judging you negatively (Negative)

b.   They are just having a good time and they aren't pointing at you (Positive)

c.   They are looking for trouble and trying to provoke you (Hostile)

d. They are talking about someone behind you (Neutral)

7. A group of coworkers is sitting together talking. The moment you come in, the conversation falls silent. How likely is it that:

    a. They are planning a way to recognize you or celebrate something with you (Positive)

    b. They are doing it on purpose because they don't like you (Hostile)

    c. They just happened to finish their conversation as you walked in (Neutral)

    d. They are complaining about work, but don't want to include you (Negative)

Appendix F

Hostile Attribution Bias Vignettes

1. You walk through the street where three boys are playing street hockey. As you pass them, you hear them laugh.

   a. They were laughing at you (Negative)

   b. They made a joke among themselves (Neutral)

   c. They want to provoke a fight with you (Hostile)

   d. They laugh because they are happy to see you (Positive)

2. You are at a local dance club. While you are dancing someone bumps into you.

   a. He did this to provoke a fight (Hostile)

   b. He was dancing, it happened by accident (Neutral)

   c. The man was not feeling well and as a consequence he lost his balance and bumped into you (Negative)

   d. The man was a friend who tripped over when he greeted you (Positive)

3. Kids are playing baseball in front of your house. Their ball shoots through your window and glass is flying around.

   a. The kids nowadays break everything (Negative)

   b. The kids' parents have insurance so no harm was done (Positive)

   c. The kids are trying to make me mad on purpose (Hostile)

   d. The kid whose turn it is, is really bad at aiming (Neutral)

4. You are at a bar and a very drunk man next to you trips over your feet and your drink slips out of your hands.

   a. The man is after me, he is up to a fight (Hostile)

    b. My drink fell out of my hand because he stepped on my feet by accident (Neutral)

    c. The man stepped on my feet because he was pushed by someone else (Negative)

    d. You smile, he reminds you of a nice evening when you had too much to drink (Positive)

5. Your friends go out for lunch without asking you.

    a. They don't want me with them (Negative)

    b. Those traitors, they want to play a trick on me (Hostile)

    c. We already do enough nice things together (Positive)

    d. They thought I already had other plans (Neutral)

6. You bring your car to the garage for an oil change. When you come back you see oil lying on the floor underneath your car.

    a. Those stupid mechanics want to send me home with a broken car so that I have to come back and they can take advantage of me (Hostile)

    b. Your inexperienced nephew refreshed the oil, you are proud that he is working here (Positive)

    c. That oil stain was on the ground before (Neutral)

    d. They did not finish and clean up properly (Negative)

7. You are walking in a very crowded shopping street. You notice that a group of people is talking loud and is pointing in your direction.

    a. They point at you because they notice something about your clothes (Negative)

    b. They are happy to see you (Positive)

    c. They do not want you near them and look at you in a threatening way (Hostile)

    d. They talk about someone or someone behind you (Neutral)

8. At work a group of your colleagues is sitting together talking. The moment you come in the conversation falls silent.

   a. Your colleagues are planning a party for you (Positive)

   b. They are probably criticizing you because they want to put you in a poor light (Hostile)

   c. They seem to be finished with the topic they were talking about (Neutral)

   d. Your colleagues are talking about a sad incident, they might want to spare you the memory (Negative)

Appendix G

Demographic Survey

1. Age: _____

2. Race/Ethnicity (Check all that apply):

□ African American   □ Asian   □ Caucasian (non-Hispanic)

□ Hispanic   □ Pacific Islander   □ Other _____

3. Gender: □ Female   □ Male

4. Major: _____

5. Year in School:

□ Freshman   □ Junior   □ Other _____

□ Sophomore   □ Senior

6. What is your best estimate of your family's total combined income over the last year?

   $0 to $14,999

   $15,000 to $24,999

   $25,000 to $49,999

   $50,000 to $74,999

   $75,000 to $99,999

   $100,000 to $149,999

   $150,000 to 200,000

   Above $200,000

7. Is English your native language? □ Yes □ No

8. What is the language that you speak/read most? _____

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