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IMPLICIT AGGRESSIVE PERSONALITY: ENHANCING THREAT DETECTION BIAS AND SENSITIVITY IN THE PRESENCE AND ABSENCE OF TRUE THREAT

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TABLE OF CONTENTS

Page

LIST OF TABLES

Appendix Table Page

LIST OF FIGURES

ABSTRACT

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The ability to correctly identify a situation as threatening will help not only a policeman or soldier, but also civilians who own guns, not to mention possible offenders or bystanders. Though threat detection concerns are of great importance, neither practitioners nor researchers have a complete understanding of the antecedents of threat detection, specifically, systematic differences in threat detection bias. The present study extended research and practice's understanding of the antecedents to threat detection bias by showing that (1) both implicit and explicit aggression can work interactively with threat context to predict a heightened bias to perceive threats and (2) threat context (holding a threatening vs. a non-threatening object), cognitive load, and the implicit motive to aggress may (interactively) contribute to the prediction of threat detection sensitivity and, more generally, threat detection inaccuracy.

INTRODUCTION

In 2007, Blackwater security personnel shot and killed seventeen Iraqi civilians, claiming that they shot in self-defense following provocation by gunfire damage to three of their vehicles. Later, government officials reported that the shooting occurred when security guards fired in response to gunfire by other members of their unit in the mistaken belief that they were under attack (Glanz & Tavernise, 2007). This example illustrates the disastrous consequences of an *appraisal malfunctioning* (Scherer, 1987) such that the individual's threat detection mechanisms erroneously activate. Specifically, individuals may erroneously detect threats that are *not* present (i.e., false alarm) or erroneously *fail* to detect threats that are present (i.e., miss; Wiley, 1994). Such appraisal malfunctioning is not an isolated event, military or elsewhere.

In fact, similar incidents have occurred since: in Baghdad, an Army Apache helicopter crew shot a photographer because the crew mistook the photographer's camera for a gun (Carey, 2010); in Kabul, Afghanistan, American-led military troops fired and killed five civilians and wounded eighteen additional civilians on a passenger bus because the troops believed the bus to be a military threat (Oppel & Shaw, 2010). Analogous incidents have occurred closer to home, such as the death of seventeen-year old Trayvon Martin by community watchman George Zimmerman, who claimed that Mr. Martin (who was unarmed) was behaving in a suspicious and threatening manner

(Lee, 2012). Alternately, there have been incidences of erroneous *oversight* of threat that have endangered those involved. For instance, despite multiple clues of the impending September 11th attacks, officials failed to piece together this information to ultimately detect the true and impending threat (Shrader, 2007) that resulted in the worst terrorist attack in modern history.

All of these situations share the aspects of (1) inaccurate threat detection and (2) members of protection or armed forces occupations. These types of occupations, such as police officer or soldier, inevitably predispose individuals to threatening situations. It follows, then, that these individuals benefit from the ability to recognize and discriminate between threatening situations vs. non-threatening situations. In addition to armed forces establishments benefitting from a better understanding of threat detection processes, civilians would also benefit from this information. Over 500,000 individuals in the state of Indiana alone own a gun permit ("Firearms Licensing Statistics," 2014). Thus, the ability to correctly identify a situation as threatening will help not only the policeman or soldier, but also civilians who own guns, not to mention the possible offenders or bystanders. If an individual correctly identifies a situation as threatening, he or she can act accordingly to protect him or herself and others. On the other hand, the incorrect identification of a non-threat as threatening could result in injury (or worse) to the person or persons who are erroneously perceived as threatening. Additionally, if an individual incorrectly identifies a threatening situation as non-threatening, he or she will not be prepared to protect themselves or others. Given these examples of threat detection gone amiss, it is clear that this phenomenon has repercussions for the safety of everyone involved.

Though threat detection concerns are of great importance, neither practitioners nor researchers have a complete understanding of the antecedents of threat detection, specifically, systematic differences in threat detection bias. Thus far, in the cognitive literature, most attention has been given to automatic (e.g., Arnold, 1960) and evolutionary influences (e.g., Öhman & Mineka, 2001). For example, much research has been devoted to investigating the primary appraisal process (Arnold, 1960; Dodge & Crick, 1990; Lazarus, 1966). However, critics (e.g., Ellsworth & Scherer, 2003; van Reekum & Scherer, 1997) have found fault with these approaches' emphasis on controlled (i.e., conscious) processes and the post-hoc methods used to tap into these processes.

The term *threat detection bias* can be understood in two ways. Some researchers claim that individuals have evolved to develop a threat detection bias such that they have mechanisms in place to detect evolutionarily threat-relevant cues (e.g., poisonous spiders; Öhman, Flykt, & Esteves, 2001; Öhman & Mineka, 2001). I find contention with this definition because I understand the term *bias* to refer to a type of systematic skew or distortion pertaining only to individuals with that distortion rather than a biologically hard-wired mechanism that is uniformly present in all individuals. As such, I might call this biological mechanism a threat detection *filter* rather than a bias. Thus, I reserve the term *threat detection bias* to refer to situations in which an individual's threat detection system systematically breaks down. Specifically, the present proposal aims to enrich research and practice's understanding of the systematic antecedents of threat detection bias, understood in terms of a break-down such that individuals with this bias have a tendency to detect threats, as well as individuals' ability to discriminate between threats and non-threats (sensitivity).

In signal detection theory (SDT: Tanner & Swets, 1954), the term *bias* more closely resembles the definition that I put forth; that is, a systematic proclivity to choose one response over another (Grier, 1971; Stanislaw & Todorov, 1999). Response bias (Grier, 1971) is calculated using hit rates (e.g., in a dichotomous signal detection study, the proportion of times that a participant responds "present" or “yes’ when the stimulus is actually present) and false alarm rates (e.g., the proportion of times that a participant responds "present" or “yes” when the stimulus is actually absent). Typical measures of response bias assume values ranging from -1 (extreme bias in favor of *yes* response - in my case "yes to *threat*") and +1 (extreme bias in favor of *no* response - "no threat"), and a value of "0" corresponds to no response bias[1]. False alarm and hit rates may also be used to calculate another family of SDT statistics designed to measure *sensitivity* (Zhang & Mueller, 2005) or the ability to discriminate among stimuli (i.e., the ability to accurately distinguish signals from noise). Throughout the current paper, I use the terms *sensitivity* and *accuracy* interchangeably. Values of sensitivity typically range from .5 (chance discriminability which suggests difficulty in distinguishing among stimuli) to 1 (perfect discriminability). In the current paper, I explored antecedents of both bias and sensitivity. Specifically, I examined personality and situational factors that can lead to bias (i.e., a general

[1] For our purposes, we recoded the measure of bias (*B″*) so that higher scores always indicate a greater tendency to see threat.

tendency to report seeing threats in the environment) and poor sensitivity (i.e., difficulty in distinguishing threats from non-threats).

I propose to advance the past research in two ways. First, I extend prior research by considering implicit personality biases (e.g., hostile attribution bias) as influencing reactions to threatening and non-threatening objects. Specifically, I hypothesize that individuals with these implicit biases will be more likely to report seeing threats in their environment (when present or not) compared to those individuals who do not share these implicit biases. Scant research has explored non-clinical personality variables (e.g., neuroticism: Watt & Morris, 1995; anger: van Honk, Tuiten, de Haan, van den Hout, & Stam, 2001) and their link to threat detection. And, to date, no one has examined how implicit biases linked to the motive to aggress (James et al., 2005; James & LeBreton, 2010) are linked to threat detection efficacy. In addition to examining the role of implicit biases in threat detection, the present set of studies will also integrate these biases with two contextual factors: (1) whether the respondent is in possession of a threatening item (e.g., a gun) and (2) whether the respondent is under cognitive duress when making a threat appraisal.

In sum, I investigate whether or not implicit biases linked to the motive to aggress will induce threat detection bias and sensitivity, and how those effects might add to or interact with the effects of possessing a threatening or non-threatening object or experiencing a cognitive load when making threat appraisals. These contextual factors are important because many of the documented threat detection breakdowns have occurred by individuals carrying weapons making split-second decisions in environments characterized by various distractions. One study has shown that the mere action of holding a weapon (or what I call "threat context") enhances threat detection bias (Witt & Brockmole, 2012). However, to my knowledge, no research has explored whether the effects of threat context on threat detection bias might be further exacerbated by cognitive load and/or by personality-linked implicit cognitive biases (e.g., hostile attribution bias).

I believe that through understanding the foundation of an individual's personality, I might identify key motivational processes involved in threat detection bias, thus informing both researchers and practitioners such that they can better manage and reduce it. I find merit in exploring what elements, specifically individual difference factors and situational/contextual features might explain threat detection efficacy. As such, the proposed studies examine the relationship between implicit personality and threat detection within the context of the implicit biases associated with implicit aggressive personality (James, 1998; James, McIntyre, Glisson, Bowler, & Mitchell, 2004; James & LeBreton, 2010, 2012).

Prior to explicating a study through which I hope to expand the applied personality research, I (1) discuss threat detection and why its antecedents are not yet fully understood and (2) explain my rationale for applying the biases associated with implicit aggressive personality to explain differences in individuals' threat detection. Specifically, in my study I attempted to replicate previous research in demonstrating the impact of threat context on threat detection bias, as well as contribute the novel finding that implicit aggression, threat context, and cognitive load can interactively affect an individual's ability to discriminate between threats and non-threats.

Threat Detection

Threat detection connotes an organism's appraisal of its environment. Specifically, threat detection is a type of primary appraisal (Lazarus, 1966) that ensures an organism's well-being and precedes secondary appraisal during which the organism demonstrates its ability (or inability) to cope with the situation (Ellsworth & Scherer, 2003; Lazarus, 1966). Arnold (1960) characterized primary appraisals as direct, immediate, and intuitive evaluations. Furthermore, the detection of threat often occurs automatically, without conscious awareness or control, as the body prepares itself for action in the face of environmental threat. As such, appraisals - an organism's constant evaluation of environmental changes relevant to the organism's well-being - are necessary for the organism's survival. For instance, fear might induce an organism to flee, but the organism might soon realize that the threat is in actuality directed at someone or something else (reinterpretation of the event) or that an aggressive stance will intimidate the attacker (reinterpretation of response alternatives; Ellsworth & Scherer, 2003).

Öhman and Mineka (2001) argued that threats likely manifest in aversive contexts such that individuals are more prone to be on the lookout for threats if their environment provides clues to them to do so (e.g., hearing a large animal move in the darkness). Thus, individuals have a threat-detection mechanism in place such that they are biologically prepared to detect threats and maintain their own survival (Öhman & Mineka, 2001). From an evolutionary perspective, fear is an essential part of survival and, thus, individuals have learned over time to feel fear in certain contexts (e.g., dark areas) to ensure their survival. The sensitivity to such survival-related cues reflect individuals' ability to be selective (Seligman, 1970) such that they can identify critical events with little neural activity, thus enabling a quick, defensive reaction (e.g., fight or flight; Öhman & Mineka, 2001).

Furthermore, over time, humans have developed mechanisms to identify stimuli related to often-experienced survival threats, whether or not the threat manifests in an individual's consciousness (Bargh, 1989). Specifically, evolutionarily fear-relevant stimuli (e.g., snakes) shows evidence of *pre-conscious automaticity* through generating a reaction in an individual even though the individual might not have a conscious awareness of that stimuli (Esteves & Öhman, 1993; Öhman & Soares, 1993). Through multiple empirical tests, Öhman and his colleagues have found that an individual's physiological responses to situations could be activated pre-attentively (e.g., Öhman et al., 2001), further indicating that evolution has adapted our perceptual processes to respond to relevant stimuli - particularly, threats.

In summary, the extant research suggests that individuals possess an ability to detect threats in their environment and that much of the threat detection process operates unconsciously. However, most of this research has focused on evolutionarily-relevant stimuli (e.g., snakes). The current study seeks to examine whether more contemporary stimuli (e.g., guns) also activate this threat detection process. In addition, if threat detection processes operate in a largely unconscious or automatic manner, then I believe that examining threat detection processes (and the subsequent reactions to perceived threats) may be enhanced by studying unconscious or implicit motives that may predispose individuals toward being particularly sensitive to impending threats. Specifically, I believe that measuring the implicit cognitive biases related to the motive to aggress (e.g., hostile attribution bias) could improve our understanding of why particular individuals have a predilection to perceive threats, whether present or not.

Threat Detection: Beyond Primary Appraisal

Cognitive psychologists van Reekum and Scherer (1997) critiqued the primary experimental paradigms that appraisal researchers use. One criticism of the experimental methods used to test appraisal theories, is the methods' reliance on explicit or conscious processes to describe what is theorized as an unconscious processes (Berkowitz, 1994; Ellsworth & Scherer, 2003; Zajonc, 1980, 1984). For example, some methods require self-reports from participants, recalled from memory, regarding their experiences. Furthermore, researchers (e.g., Miller 1962; Nisbett & Wilson, 1977; Parkinson & Manstead, 1992; 1993) have argued that individuals are not in the best position to report upon their own appraisal processes that occur outside of their awareness. Individuals' self-reports of their own appraisal process depends largely upon their cognitive interpretation of the event in their memory such that they rationalize their own responses in a post-hoc fashion (Nisbett & Wilson, 1977; van Reekum & Scherer, 1997). This "logical process" likely leads to an inaccurate evaluation of their appraisal, which occurs, at least in part, outside of conscious awareness (Festinger, 1957; van Reekum & Scherer, 1997). To address the limitations of post-hoc appraisal methods, cognitive psychologists have used creative reaction time studies to examine cognitive processes involved in appraisal (e.g., the IAT: Greenwald, McGhee, & Schwartz, 1998; affective priming task: Fazio, Sanbonmatsu, Powell, & Kardes, 1986). However, this method is questionable because the interpretations that can be made from reaction time responses are speculative (Scherer, 1992) and this method still does not answer the *content*-related appraisal questions (van Reekum & Scherer, 1997). Specifically, reaction time methods do not tell us about the motivations of individuals' true appraisal processes.

As I mentioned earlier, an organism detects threats through a direct, immediate, and intuitive primary appraisal (Arnold, 1960). While some have found that threat detection occurs automatically, without conscious awareness or control, some appraisal theorists argue that the appraisal that follows this immediate reaction (secondary appraisal; Lazarus, 1966), is contingent on the individuals' subjective interpretations of the event (Ellsworth & Scherer, 2003). Specifically, Ellsworth and Scherer (2003) argued that while individuals have mechanisms in place to detect threats automatically, individuals may have different emotional reactions to those threats. These affective reactions are related to survival and engender behavioral reactions to the perceived threats (e.g., fight or flight). This point addresses another question left unanswered by cognitive primary appraisal theories: why do individuals detect threats when no such threat is actually present in their environment? In an effort to interpret inappropriate reactions to non-threats, the following sections review theoretical and empirically-based research concerning subjective motivations associated with individual differences in threat detection.

Building from alternative approaches to threat detection and the unaddressed issues of cognitive appraisal approaches, van Reekum and Scherer (1997) theorized that certain personality dispositions (e.g., locus of control) might contribute to individuals' responses to threat and even their ability to detect that threat. Thus, while all individuals might have biologically-determined mechanisms in place to detect threats (Öhman & Mineka, 2001), they do not always use this mechanism at the same intensity, or even react similarly to the perceived threat. Since van Reekum and Scherer made their suggestions, scant research has sought to link personality to these differences in threat detection. One of the few individual difference studies found that individuals high on trait anger have increased attention to angry faces (van Honk et al., 2001). Given the scant research focused on dispositional antecedents of threat detection, this is an area ripe for exploration. To that end, I propose to explore how we can use aspects of the implicit personality, or the part of personality associated with unobservable processes and motivations, to explain threat detection. Researchers identify both situational (e.g., open spaces, dangerous areas) and individual difference factors (i.e., cognition, states) as potential antecedents of threat detection reactions. As such, before I further develop my argument for how a specific individual difference factor, the implicit motive to aggress, may play an important role in threat detection, below I address how my study will replicate and extend prior situational-related threat detection influences.

Contextually-Biased Threat Detection

There is an emerging program of research examining how individuals' environments influence their cognitions and, therefore, their perceptions of that environment. For example, one study found that a physical vs. non-physical interaction of objects, influenced individuals' awareness such that individuals who physically held a particular object (e.g., clothes hanger, cup) in a particular environment, recalled the environments as being smaller, whereas individuals who simply viewed their environments did not (Thomas, Davoli, & Brockmole, 2013). Though this program of research examining objective features of the environment is useful for threat detection research, limited research has examined the effects of internal (i.e., individual difference) - rather than environmental - features on threat detection, and to my knowledge, only one study (Witt & Brockmole, 2012) has examined the effect of the act of holding a gun on an individual's ability and proclivity to detect environmental threats. Specifically, Witt and Brockmole (2012) examined whether simply holding a gun biases an individual toward detecting external threats. The authors found that holding a gun does, in fact, predict enhanced reports of perceiving guns in others. Thus, Witt and Brockmole's (2012) findings support the effect of simply the action of holding a weapon, as enhancing biases to detect threats and act on those threats accordingly. As such, I saw this as a logical starting point for my study: what is the base rate for the effect of threat context (i.e., the possession of a threatening or non-threatening object) on reactions to threatening and non-threatening stimuli? Specifically, I offer the following replication hypothesis:

> *Hypothesis 1:* Threat context will exert a main effect on response bias, such that compared to holding a non-threatening object, the act of holding a threatening object will be related to increased levels of response bias (i.e., participant is more likely to respond that a threat is present).

Cognitive Load

In addition to replicating the Witt and Brockmole study, I expanded upon it by examining the influence of an additional situational/contextual feature that could interact with threat context to enhance the bias to perceive threats in others, as well as diminish an individual's ability to discriminate between threats and non-threats. Related to my original argument of threat detection accuracy, previous research has explored the influence of attentional resource capacity on subsequent performance. Kanfer and Ackerman (1989) argued that the factors of (a) individual differences in resource capacity, (b) task-imposed resource requirements, and (c) an individual's self-regulatory capacity for allocating attention, interact to influence task performance. Furthermore, the latter factor of this interaction, the enactment of self-regulatory processes, can hinder task performance when it demands attentional resources unrelated to the performance task.

This idea is also supported in the literature. For example, in a series of self-regulation studies, Muraven, Tice, and Baumeister (1998) found that self-regulation activities (mental control of thoughts) produced subsequent failures in self-regulation/self-control (e.g., decrease in physical stamina, giving up more quickly on a problem solving task). Task performance has also been shown to decrease when individuals experience a cognitive load or a distraction from the specific performance task. For example, drivers who talk on the phone are more likely to make driving errors such as missing stop lights or reacting more slowly to stop lights (Strayer & Johnston, 2001).

In addition, in a study more specifically related to threat detection, Kleider, Parrott, and King (2010) used a "shoot threats/don't shoot non-threats" task and found that individuals with lower working memory capacity were more likely to (1) shoot unarmed/non-threatening targets and (2) fail to shoot armed targets (Kleider, et al., 2010). In a related vein, it was reported in a U.S. Air Force technical report that 13.9% of "mishaps" or errors were attributed to cognitive factors including cognitive task oversaturation, distraction, and inattention (Thompson, Tvaryanas, & Constable, 2005).

Integrating the literature on threat context with that of cognitive load, I argue that not only will the context of holding a threatening object influence individuals to detect more threats (i.e., exhibit bias), but the strength of this effect may be greater for individuals experiencing increased levels of cognitive load. Though Witt and Brockmole (2012) found that threat context alone did not influence sensitivity - or a difference in difficulty of detecting threats from non-threats, Kleider et al. (2010) did find that lowered working memory capacity was significantly related to the extent to which participants were able to discriminate between armed and unarmed targets. As such, I hypothesize that cognitive load will interact with threat context to diminish individuals' ability to distinguish between threatening vs. non-threatening images. Stated formally:

> *Hypothesis 2:* Threat context will interact with cognitive load in the prediction of bias. Specifically, the strength of the positive relationship between holding a gun and response bias will be stronger for individuals experiencing cognitive load.

Hypothesis 3: Threat context will interact with cognitive load in the prediction of participants' ability to discriminate threats from non-threats (i.e., sensitivity). Specifically, under conditions of no cognitive load I would not expect to see a relationship between threat context and sensitivity; however, under conditions of cognitive load I would expect to see a negative relationship between threat context and sensitivity.

Implicit Personality: An Alternative Antecedent to Threat Detection

Previous literature supports the importance of the situation in threat detection accuracy, and much of the appraisal process is thought to occur automatically (e.g., Ellsworth & Scherer, 2003). As such, I sought to extend this literature by including theoretically relevant individual difference variables. In accordance with van Reekum and Scherer's (1997) recommendation to consider personality in determining the origin of threat detection and reaction, I explore broader motivational themes using person by situation interaction models (Funder, 2006). In the following sections, I review a specific implicit personality trait, the implicit motive to aggress - a construct that, as far as I know, has not been examined in terms of threat detection or signal detection theory. Yet, the implicit motive to aggress has been linked to a distinct constellation of cognitive biases associated with threat detection tendencies - specifically, a predilection to sense threats in others/ see others as threatening, regardless of the situation or whether others actually pose a threat.

In line with Ellsworth and Scherer's (2003) claim about the importance of *motivation* in influencing threat detection bias, from their own results, Baumann and Desteno (2010) concluded that threat detection bias should only emerge when people lack the motivation or ability to make accurate decisions regarding potential threats. Specifically, the authors found that if individuals had more time to process decisions about potential threats, they overcame the heightened threat detection bias such that they were able to more accurately detect threats and non-threats (Baumann & Desteno, 2010). However, stricter time constraints compromised participant accuracy. Alternately, Baumann and Desteno concluded that even when individuals have the time to process the event, they may not overcome the threat detection bias if they lack the motivation for accuracy.

Implications for individuals with implicit aggressive personality are particularly interesting because these individuals lack insight into their basic underlying motive to aggress. That is, such individuals are not aware that they systematically rely on a set of implicit cognitive biases that influence how they process information, such that they are inclined to perceive threats and justify acts of aggression because such threats are present. These implicit biases create an implicit justification or rationalization to inflict harm on others (James & LeBreton, 2010). Consequently, I argue that individuals with a strong motive to aggress not only lack introspective insight to the causes of their behavior, but have an implicit tendency to generally see others as dangerous.

In summary, in the current study, I theorize and test the idea that (1) aggressive personality will influence threat detection such that individuals with an aggressive personality will have a heightened proclivity to sense threats in their environment and

(2) aggressive personality will interact with situations evocative of threat such that aggressive individuals will be more motivated to perceive threats, both in situations redolent of threat and situations that diminish their ability to thoughtfully process information.

Now, I elucidate one stream of research that has not yet been associated with threat detection: *implicit aggressive personality*. I believe that this line of research is particularly compelling with regards to threat detection, particularly with respect to the motives or biases associated with implicit aggressive personality (James, 1998). I focus on how the six unique biases (e.g., hostile attribution bias) associated with the implicit motive to aggress will likely influence threat detection and how individuals will react to threats vs. non-threats. Finally, I examine ways in which threat context and cognitive load might interact with implicit aggressive personality to enhance threat detection bias and/or sensitivity. In the following sections, I provide an overview of implicit personality theory and explain why certain individuals might be more prone to detect environmental threats and react in accordance with that perceived threat.

Implicit Personality

An individual's motive to aggress depends in part on his or her personality. McClelland Koestner, & Weinberger (1989; see also Winter, John, Stewart, Klohnen, & Duncan, 1998) classify personality as both explicit and implicit. The *explicit facet of personality* reflects observable behaviors through which either others make judgments about an individual or the individual makes about himself through introspection (Hogan, Hogan, & Roberts, 1996; Frost, Ko, & James, 2007). Researchers typically measure aspects of explicit aggression through questionnaires such as the verbal aggression and hostility scales from the Aggression Questionnaire (Buss & Perry, 1992). The second facet of personality, the *implicit personality*, refers to the unobservable processes or motives behind an individual's observable behavior (James, 1998; James & LeBreton, 2012). Individuals are unable to make introspectively accurate attributions regarding behavior motivated by aspects of the implicit personality (Hogan et al., 1996; James & LeBreton, 2012). Instead, the implicit personality must be measured indirectly. For example, a researcher might use projective tests or response latency measures to indirectly measure implicit, motive-based cognitions (James & LeBreton, 2012). Alternatively, an individual's implicit motives may also manifested in the way through which he or she justifies or rationalizes his or her behavior (James, 1998; James et al., 2005).

For example, a soldier might justify attacking a group of civilians in an enemy territory because he deemed the civilians as untrustworthy and likely working with the enemy; and therefore, deserving of aggression (i.e., *derogation of target bias, hostile attribution bias*; James, 1998; James &LeBreton, 2012; James et al., 2004; James, et al, 2005). However, if these civilians were not actually working with the enemy but instead were neutral parties or friendly toward the soldier, this justification for harming civilians represents an *enhanced bias* for aggression and reflects the soldier's attempt to rationalize the harmful behavior. One of the primary criticisms of traditional threat appraisal experimental paradigms is that they seek to understand how personality exerts implicit (or automatic) influences on threat detection, yet they are measuring personality with *self-reports*. Such self-reports are ideally suited to measure the explicit aspects of personality that are available for controlled, conscious introspection.

However, if the threat appraisal process is believed to happen in a largely automatic or implicit manner, researchers must look to other forms of indirect measurement.

Historically, the indirect measurement systems used to assess implicit motives (e.g., projective tests) have been criticized on psychometric grounds (James & Mazerolle, 2002; Lilienfeld, Wood, & Garb, 2000; Spangler, 1992). However, a more recent measurement system, called conditional reasoning (James, 1998; James & LeBreton, 2012), was developed to overcome these psychometric limitations. Tests developed using conditional reasoning are reliable, and predictive of an array of objective criterion behaviors. For example, the conditional reasoning test for aggression (CRT-A) has been shown to predict both passive and active forms of aggression with uncorrected correlations ranging from the .10s to the .60s (James & LeBreton, 2012).

The CRT-A was built upon the notion that aggressive and non-aggressive individuals behave differently because they frame and perceive the world differently. Specifically, though both aggressive and non-aggressive individuals want to see their behavior as rational, aggressive individuals' behavior often tends to be unwarranted, inappropriate, or too severe. James and colleagues (e.g., James et al., 2005; James & LeBreton, 2010; 2012) argue that aggressive individuals are able to rationalize their inappropriate behavior because they rely on a unique set of justification mechanisms (JMs) - or implicit biases (e.g., hostile attribution bias, retribution bias) - that justify aggressive behavior. For example, an aggressive individual has a bias to value retaliation over reconciliation (retribution bias), and so is able to rationalize the "eye for an eye" principle rather than reconciling a conflict through non-confrontational means.

The CRT-A (James, 1998) is designed to measure a number of JMs and does so indirectly by asking respondents to solve inductive reasoning problems. Although these problems appear as traditional cognitive ability items, they are instead designed to measure the unique JMs linked to the motive to aggress. These JMs systematically influence framing and reasoning across all areas of the respondent's life (Gollan & Witte, 2008) - whether the individual is on a battlefield or in a less stressful situation, such as having dinner with friends. For example, the same aggressor who uses the JM of the *derogation of target bias* to rationalize aggressing towards civilians, may also be likely to start a fight with an opposing team's fan at a football game (seeing the fan as an outgroup member, untrustworthy, and having dissimilar values).

Implicit Aggressive Personality as an Antecedent to Enhanced Threat Detection Bias

I now turn to an explication of the justification mechanisms (JMs) associated with the motive to aggress and how they are believed to relate to threat detection sensitivity. Inherent in these JMs is the idea that implicitly aggressive individuals engage in a largely automatic processing of information related to their interactions with others. By definition, automatic processing occurs implicitly or unconsciously (Kihlstrom, 1987). Though some automatic processes can be brought under controlled or conscious processing (e.g., stereotyping: Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000), I focus on a subset of automatic processes - the JMs associated with the implicit motive to aggress - that the existing literature suggests are difficult to bring to consciousness or modify (e.g., James et al., 2005; James & LeBreton, 2012). Essentially, I theorize that the implicit motive to aggress will systematically lead to (1) enhancing an individual's bias to detect threats and (2) diminishing an individual's ability to discriminate among stimuli.

Hostile Attribution Bias

From a theoretical perspective, van Reekum and Scherer (1997) explored individual differences that might systematically affect appraisal. They suggested an individual's v*igilance*, or the detection of events that are pertinent to an individual, might influence whether an individual decides to attend to an event at all. Specifically, an individual's general inclination to search for threats in his/her environment increases both his/her sensitivity towards threat and the tendency to have a gut or unconscious reaction. The general trait of vigilance may be linked to the *hostile attribution bias*, which represents the predilection to sense hostile or malevolent intent in others (James, 1998). Individuals with a hostile attribution *bias* (James, 1998) overestimate the degree to which antagonism is actually present (e.g., attribute the cause of a missed appointment to intentional antagonism), when perhaps antagonism is not present (e.g., the individual's car broke down and so he missed the appointment).

As such, hostile attribution bias provokes self-deception processes within the individual such that the individual feels under attack and therefore, aggressing towards the perceived attacker is often framed as a rational response (i.e., I must defend myself). Hostile attribution has been found to relate to social maladjustment in children (see Crick & Dodge, 1994 for a review) and reactive aggression (Dodge & Coie, 1987). My theory is further corroborated by the research finding that provoked, aggressive individuals rely on skewed cognitive schemata (i.e., their own aggressive proclivities) to aid in their detection of the degree of hostile intent in others, such that chronically aggressive individuals may devote more cognitive processing to self-relevant (i.e., aggressive) cues (Epps & Kendall, 1995; Kendall, Ronan, & Epps, 1991).

Victimization by Powerful Others Bias

In their theoretical review of individual differences that may contribute to heightened sensitivity for threat detection, van Reekum and Scherer (1997) suggested that an individual's attribution of an event as either controlled by *internal locus* or *external locus* relates to threat detection such that some individuals may, in extreme cases, overestimate their control of an event, whereas other individuals may feel that they have no control at all. An individual who consistently feels hopeless (extreme external locus) during the unfolding of events, might also consistently feel that the environment poses pervasive threat, and so these individuals have a heightened sensitivity to perceive threat in others.

In a related vein, implicitly aggressive individuals likely perceive their environments as related to inequity, exploitation, injustice, and oppression by others, in particular, authority figures or other powerful entities (e.g., the government or large corporations; James & LeBreton, 2012). Individuals with this bias constantly feel externally controlled and oppressed – a feeling that stimulates anger and injustice within the aggressive individual. This bias is also closely related to Bandura's (1999) *moral justification* disengagement practice such that individuals (e.g., soldiers) justify violence through re-evaluating themselves not as murderers, but as crusaders fighting against oppression and protecting their own values and rights (e.g., freedom). As such, the victimization by powerful others bias serves as an impetus for individuals to rationalize aggression towards the powerful other as a legitimate reaction against oppression and inequity. As such, I argue that when primed to determine whether other individuals hold a weapon (thereby having power), individuals with the victimization by powerful others bias will more readily perceive the other individuals as holding a weapon, even when they do not.

Retribution by Powerful Others

Not only can the goals and motives determine threat detection and subsequent decision-making with regards to impending threat, but the social context that the individual observes can influence threat detection and decision-making as well. For instance, Becker et al. (2011) examined the influence of both (state) bias (i.e., self-protection vs. revenge-mindedness) and sensitivity (or selectivity) towards detecting threats (i.e., angry faces) and found that both self-protectiveness and revenge-mindedness enhanced anti-male, anti-angry, and anti-group biases. Specifically, they sought to examine how these factors influenced accuracy. They found that self-protectiveness lead to greater accuracy while revenge-mindedness contributed to the characterization of outgroup individuals as enemies, but did so at the cost of overall accuracy. Specifically, revenge-minded individuals incorrectly detected threats when there were none (e.g., revenge-minded individuals incorrectly identified *smiling*, outgroup individuals as “enemies”) and also misidentified threats as non-threats (e.g., incorrectly identified *angry*, in-group members as “friends”). As such, these authors concluded that because the purpose of revenge is retributive, this retribution can be more easily accomplished by retaliating against entire groups – ultimately biasing response reactions such that revenge-minded individuals inaccurately perceive threats when they are not present and fail to perceive threats when they are present.

Like the hostile attribution bias research, the Becker et al. (2011) article only examined *state* retributive bias. I plan to examine retribution in the form of the implicit *retribution bias* that reflects an aggressor's predilection for retaliation/revenge over forgiveness/reconciliation (James, 1998). Specifically, when dispositionally aggressive individuals perceive that another individual wrongs them, the former would rather retaliate and seek retribution and revenge, rather than cooperate, forgive, or maintain a relationship with the perceived wrong-doer. In other words, individuals who rely on this bias are more likely to see acts of vengeance as logically superior to acts of reconciliation. Revenge is seen as a tool for restoring wounded pride resulting from the disrespect of a provocateur. As such, aggressive individuals rationalize their own aggression by perceiving the targets as provoking aggression themselves and, as such, responding with aggression in order to restore respect is a reasonable response. Because aggressive individuals are in the "retaliation" mindset across situations, I argue that they will be more likely than non-aggressive individuals to "retaliate" against perceived threats in their environment. Specifically, I predict results similar to Becker et al. (2011) such that aggressive individuals will detect threats more often as a way to retaliate against the impending danger. Although individuals with this bias will be more likely to detect threats, they will do so at the cost of the overall accuracy.

Social Discounting

An individual's social standards or moral norms are particularly relevant to threat detection because it is upon these norms that the individual bases his or her reactions. For instance, one individual's standards for a reaction to a threat (e.g., violence) will most likely differ from someone else who has "higher" moral standards or adheres to pro-social norms (e.g., values reconciliation vs. retaliation). For these individuals, norm-discrepant behavior would likely bother or produce guilt. Ellsworth and Scherer (2003) point out that individuals use dimensions such as legitimacy, value relevance, or compatibility with external standards to evaluate their actions against their perceived norms. The potential for systematic bias of these reactions may lie in features such as under-socialization or asociality, both of which, similar to implicit aggression, rely on skewed cognitive schemata to reduce behavior-norm discrepancies, thus rationalizing antisocial behavior (van Reekum & Scherer, 1997).

Similarly, the *social discounting bias* involves the tendency to favor socially unorthodox, as opposed to socially acceptable, and antisocial intentions on the part of others as likely motivations of events and relationships (James, 1998). As such, aggressive individuals typically disparage conventional or traditional ideals held by non-aggressive individuals. Furthermore, aggressive individuals tend to lack sensitivity, empathy, or concern for social customs that they perceive as attempts to demean individuals. On the other hand, non-aggressive individuals tend to reason that society benefits from accepting and respecting traditional ideals and conventions. Even soldiers, though placed in violent situations, are trained to make appropriate and controlled decisions and not necessarily *violent* ones intended to harm the innocent. On the other hand, aggressive individuals disregard conventional beliefs, or even what non-aggressive individuals might deem as objective beliefs, as constricting and demeaning. With regards to the current proposal, it makes sense that aggressive individuals might be aware that, conventionally, society as a whole favors non-violence. However, an aggressive individual may argue that violence is necessary to protect, establish dominance, etc. As such, given the opportunity, dispositionally aggressive individuals will be more likely to use weapons and to perceive others as having weapons as a means of justifying their own aggression. Such individuals will rationalize aggressive behavior by claiming that they are simply protecting themselves and must establish their own dominance or the other individual will.

Derogation of Target

Bandura's moral disengagement practice also involves *dehumanization*, or the stripping of the victim's humanistic properties such that the enactor of violence no longer views his victims as essentially human and, rather, views victims as savages or degenerates (Bandura, 1999). This process is closely related to what James (1998) calls the *derogation of target bias* that operates such that the aggressor characterizes the targets of his or her aggression in similarly negative terms (e.g., as savages, untrustworthy). In addition, aggressors attend to the negative information about the target, and tend to ignore any positive traits in the target, such that the aggressor can justify his aggression as a reasonable reaction to the negatively-connoted target.

Potency Bias

The *potency bias* (James, 1998) refers to aggressive individuals' belief that behaving aggressively demonstrates their strength or dominance over the target. Alternately, aggressive individuals with this bias tend to believe that behaving non-aggressively reflects weakness or cowardice. Again, each of the six biases of implicit aggression, including the potency bias, follows the rationale of aggressive individuals relying on skewed cognitive schemata to process self-relevant (i.e., aggressive) cues (Epps & Kendall, 1995; Kendall et al., 1991). As such, aggressive individuals use the potency bias to justify aggression as an act of bravery that earns respect from others, as well as a way to avoid powerful others taking advantage of aggressive individuals. If dispositionally aggressive individuals value acts of aggression in most situations (even when a threat is not present), then it follows that the potency bias may induce these individuals to raise their weapons (as an aggressive precaution) in the face of a potential threat.

Overall, very few studies have examined the moderating role of personality as affecting bias and sensitivity to threat detection (e.g., van Honk et al., 2001; Watt & Morris, 1995). Of the few studies that exist, they have focused exclusively on the explicit aspects of personality (e.g., explicit aggression; Baumann & Desteno, 2010). Thus, we do not know the extent to which implicit personality may impact an individual's ability to detect threats, or whether or not implicit personality can give us information above and beyond explicit personality. As such, I acknowledge a two-sided issue: when an individual has biases in place to see threat in others, feel victimized by others, etc., what happens in terms of (1) his or her ability to accurately detect threats and (2) how he or she reacts to that potential (or not) threat? Because implicit aggression, as well as threat detection, have been characterized as operating at largely an automatic or unconscious level, I expect implicit aggression to interact with threat context to stimulate faster reaction times to stimuli that the participant, presumably unconsciously, deems as threatening (irrespective of whether the stimuli is actually a threat). On the other hand, explicit aggression is believed to largely impact more controlled or conscious elements of cognition, affect, and behavior. Consequently, I hypothesize that an individual's explicit personality will be related to reaction times to stimuli that represent a confirmed, actual threat. This hypothesis is consistent with previous research that has found explicit personality traits to be associated with faster reaction times to actual threatening stimuli (Owen, 2011). Stated formally:

Hypothesis 4: Higher levels of (a) implicit aggression and (b) explicit aggression will be positively related to response bias.

Hypothesis 5: Higher levels of (a) implicit aggression and (b) explicit aggression will be related to decreased sensitivity.

Hypothesis 6: (a) Higher levels of implicit aggression will be related to faster reactions to perceived threatening stimuli and (b) higher levels of explicit aggression will be related to faster reaction to times to threatening stimuli.

In addition, I extend research in this area by examining how implicit and explicit motives may interact with threat context to enhance the bias to perceive threats in others. In this vein, I proposed that holding a threatening vs. a non-threatening object will interact with aggression such that the strength of the relationship between threat context and threat detection bias will be stronger for aggressive individuals. Because aggression-related tendencies such as revenge-mindedness (Becker et al., 2011) and anger (Baumann & Desteno, 2010; van Honk et al., 2001) have been shown to predict inaccuracies or overestimation of threats, I predicted that both implicit and explicit aggressive personality would have the same effect, further enhanced by holding a threatening object. If aggressive individuals already feel that "the world is out to get them" and value "retaliation vs. reconciliation," it follows that their holding a threatening object, a context which, by itself, influences detecting more threats than when holding a non-threatening object (Witt & Brockmole, 2012), might serve to magnify their perception of the situation as being threatening (e.g., "I'm holding a gun so I might have to use it" or "I have the right to use it and it is better to be safe than sorry"). Thus, I predict that the strength of the relationship between threat context and threat detection will become stronger as the level of dispositional aggression increases. Finally, as I noted above, higher levels of the implicit motive to aggress are believed to underlie the automatic (unconscious) reactions to situations/stimuli, particularly in situations redolent of threat. As such, I predict that the unconscious motive to aggress will interact with threat context to predict faster reaction times to *perceived* threats; however, I expect explicit aggression to influence reaction times to *actual* threats. Formally, I plan to test the following hypotheses:

Hypothesis 7: Aggression will interact with threat context in the prediction of bias. Specifically, the positive relationship between threat context (i.e., holding a gun vs. a ball) and bias will be stronger for those individuals with higher levels of (a) the implicit motive to aggress and (b) explicit aggression.

Hypothesis 8: Aggression will interact with threat context in the prediction of sensitivity. Specifically, I do not expect a relationship between threat context and sensitivity for individuals with lower levels of aggression; however, I do expect a negative relationship between threat context (i.e., holding a gun vs. a ball) and sensitivity for individuals with higher levels of (a) the implicit motive to aggress and (b) explicit aggression.

Hypothesis 9: Aggression will interact with threat context in the prediction of reaction times. Specifically, I do not expect a relationship between threat context and reaction times for individuals with lower levels of aggression; however, I do expect a negative relationship between (a) higher levels of implicit aggression and faster reactions for perceived threats. I also expect a negative relationship between (b) higher levels of explicit aggression and faster reaction times to threatening stimuli.

Furthermore, I extend the research involving cognitive load by suggesting that the strength of the relationship between cognitive load and both threat detection bias and sensitivity will be stronger for individuals with higher levels of implicit aggression. Past research supporting this notion found that individuals were more likely to rely on stereotypic or heuristic processing when their cognitive resources were strained (e.g., Bodenhausen, 1990; Gilbert & Hixon, 1991; Macrae, Hewstone, & Griffiths, 1993). For example, Macrae et al. (1993) found that individuals under cognitive load (rehearsing an 8-digit number for recall) were more likely than non-cognitively-loaded individuals to recall more stereotypic-relevant information from an event. Implicit aggressive biases operate similarly to stereotypes in that they operate outside of conscious awareness such that when processing capacity for an individual is low - the unconscious biases in a sense, take over the actions of the individual. Furthermore, Goldinger, Kleider, Azuma, and Beike (2003) found that cognitive loads can lead individuals to rely on automatic processes; this is consistent with the stereotyping literature in that it supports the notion that judgments require effortful resistance and this effort is more difficult for cognitively-loaded individuals. Finally, Gilbert and Gill (2000) found that it takes effort, time, and mental resources for individuals to even consider that their judgments might be affected by their dispositions. In light of these findings I posit that, particularly under cognitive load, individuals with implicit aggressive personality will be more likely to rely on heuristic processing of information through the JMs for aggression and, thus, make inaccurate judgments. Specifically, I hypothesize the following:

> *Hypothesis 10:* Implicit aggression will interact with cognitive load context in the prediction of bias. Specifically, the positive relationship between implicit aggression and bias will be stronger for individuals who experience an additional cognitive load.
>
> *Hypothesis 11:* Implicit aggression will interact with cognitive load context in the prediction of sensitivity. Specifically, the negative relationship between implicit aggression and sensitivity will be stronger for individuals experiencing an additional cognitive load.

I now turn to the more nuanced relationship among my three variables of interest: threat context, cognitive load, and implicit aggression. In light of the extant literature on threat detection, I argue that the impact of implicit aggressive personality on both bias and sensitivity might be further exacerbated by a situation that hinders individuals' ability to deliberately process information (cognitive load) and a situation that has already been shown to enhance threat detection bias (threat context). Specifically, I argue that when an individual experiences these two factors (threat context and cognitive load), the JMs associated with implicit aggression will be more likely to "take over" and guide an individual's behavior in the direction of threat detection bias and decreased sensitivity.

The difficulty in examining discreet acts of aggressive behavior is that it has a very low base rate (Frost, 2005). Considering the low base rate of violent and non-violent acts of workplace aggression (Barling, Dupré, & Kelloway, 2009), the key to examining acts of aggression in a non-field setting may very well lie in the situation. As such, the situation must be ripe for aggression such that the situation creates the opportunity for (or even provokes/triggers) the motive to aggress to influence behavior. James et al. (2005) demonstrated this phenomena with their set of studies involving participants who were more likely to aggress (often passively, for example "get even" with experimenters by lying to them, stealing from them, or cheating on one of the experimenter's activities) after first being provoked (e.g., were kept waiting by experimenters and then later, during the experiment, were surprisingly told that they only had fifteen minutes to complete the experiment; constantly harassed by experimenters to finish the experiment in a more timely manner, etc.). In other words, the aggressive motive alone was not enough to evoke aggressive behavior from individuals possessing the motive to aggress, the motive was only expressed in those situations that triggered or activated the motive.

As noted earlier, individuals are likely to rely on stereotypes, or their unconscious processes when their processing capacity is low (e.g., Gilbert & Hixon, 1991) and, in turn, individuals are less likely to rely on such stereotypes when their processing capacity is high and they are able to make controlled judgments. As such, I created a situation involving (a) ambiguity (pictures containing either a gun or a shoe) and (b) distraction (cognitive load) in order to create a complex situation for individuals such that their processing capacity was low. Thus, I predicted that individuals with the unconscious motive to aggress, would likely rely on this motive when distinguishing among pictures containing threats (gun) vs. no threats (shoe). In other words, because individuals with the implicit motive to aggress have a heightened proclivity to sense danger in others, etc., I hypothesized that both a threatening context (holding a gun) and a distracting situation (cognitive load) would channel their motive to aggress into their threat detection behavior such that they had a bias towards detecting threats and perform poorly in terms of correctly identifying images as threats or non-threats. Specifically, I hypothesized the following:

> *Hypothesis 12:* Cognitive load will interact with both threat context and implicit aggression in the prediction of bias. Specifically, the two-way interaction between implicit aggression and threat context in predicting bias will be stronger (i.e., exacerbated) when participants

are under conditions of cognitive load. In contrast, the interaction of implicit aggression and threat context in the prediction of bias is expected to be weaker when participants are not placed under cognitive load.

Hypothesis 13: Cognitive load will interact with both threat context and implicit aggression in the prediction of sensitivity. Specifically, the two-way interaction between implicit aggression and threat context in predicting sensitivity, will be stronger (i.e., exacerbated) when participants are under conditions of cognitive load, such that it is more difficult for individuals who are cognitively loaded, holding a gun, and who have implicit aggression, to detect the difference between a threat and non-threat. In contrast, the interaction between implicit aggression and threat context in the prediction sensitivity is expected to be weaker when participants are not placed under cognitive load.

CURRENT STUDY

Method

Participants

Participants were undergraduate students at a large Midwestern university who completed the study either (1) in partial fulfillment of an introductory psychology course requirement or (2) in fulfillment of an optional extra credit opportunity for an Industrial/Organizational Psychology course. With my research team, I collected the data for this study over the course of 2 semesters, and the final sample consisted of 378 participants. Most participants were female ($N = 233$; 61.5%) and White ($N = 259$; 68.3%) and 98% of this final sample was between the ages of 17-24.

Overview of Study

The current study involved two parts. In the first part of the study, individuals completed an online survey containing the Conditional Reasoning Test for Aggression (CRT-A; James & McIntyre, 2000; James et al., 2004, 2005) as well as several other surveys measuring demographic characteristics and personality traits/motives. In the second part of the study, participants took part in a lab experiment, during which they were randomly assigned to one of two threat context conditions: holding either (a) a plastic gun or (b) a foam ball (neutral object). Within each condition, participants were then asked to view a series of images containing pictures of individuals who were holding guns (i.e., a threat) or shoes (i.e., a non-threat). Each participant was asked to review the series of images two times, once under normal testing conditions (i.e., no cognitive load) and once after being asked to memorize an 8-digit number (i.e., cognitive load). Cognitive load served as a within-subjects experimental factor and was counterbalanced across individuals. Thus, my experimental design consisted of a basic repeated measures ANCOVA containing one within-subjects factor (cognitive load), one between-subjects factor (threat context), and one covariate or regressor variable (aggression).

Stimuli and Apparatus

I tested the proposed hypotheses using the stimuli developed by Witt and Brockmole (2012), who drew upon earlier-developed stimuli (Correll, Park, Judd, & Wittenbrink, 2002). Specifically, on a computer screen, I presented participants with different images depicting a person, that I will call the target, holding either a gun or a shoe. I presented the images in random order on the screen for a total of 76 images (the participant viewed and judged 76 images). The participants made judgments about whether the target was a "threat" (held a gun) or a "non-threat" (held a shoe). Participants made their responses to the stimuli by either (1) raising (for detected threatening object) or lowering (for detected neural object) a Nintendo Wii Magnum Gun or a foam ball (participant's neutral object) from a computer mouse. Participants used their object (gun or foam ball) to click the mouse button before they made their motion and the click of the mouse button indicated the reaction time of the movement of the object (gun or ball) in either direction, by which they indicated their perception of a threat or non-threat (see Figure 1). In accordance with previous research using this stimuli (i.e., Witt & Brockmole, 2012), I mounted the mouse on an inclined surface such that the apparatus will not restrict participants' raising or lowering movements.

Procedure

For the first part of the study, participants followed a web link to a secure, online survey. I invited participants who completed the survey, to the lab to complete the experiment which lasted approximately one hour. When participants arrived to the lab, they completed set of 20 practice trials. For these trials, participants used their object (gun or ball), to make judgments about 20 images of upward- and downward-facing arrows. Participants made the same motion as they would with the judgment task of interest, involving 76 threatening/non-threatening images. During the practice round, participants raised their arms/object when they saw an upward-facing arrow, and lowered their arms/object when they saw a downward facing arrow. Every aspect of the practice judgment task was the same as the threatening/non-threatening judgment task, except for the images.

Upon completion of the practice judgment task, participants experienced one of four randomly-assigned conditions: either a cognitive load condition in which participants held a gun (Condition 1) or a ball (Condition 2), or a non-cognitive load condition in which participants held a gun (Condition 3) or a ball (Condition 4). The cognitive load conditions (1 & 2) refer to conditions during which participants viewed an 8-digit number prior to the 76 image-judgment task, and were told that they would be asked to freely recall that number after they judged 76 images. This task has been used in the past to create what has been described as a highly cognitively-loading experience (Gilbert & Hixon, 1991; Macrae, et al., 1993). During the non-cognitively loaded conditions (3 & 4), participants were not asked to view or reproduce the 8-digit number.

Each cognitive load condition was paired with its corresponding threat context condition such that participants experienced the stimuli both in a cognitively loaded condition and a non-cognitively loaded condition. Specifically, cognitive load conditions (Conditions 1 & 2) were counterbalanced with non-cognitive load conditions (Conditions 3 & 4) such that participants either experienced Conditions 1 & 3 in the lab (holding a gun during both a cognitively loaded and non-cognitively loaded judgment task) or they experienced Conditions 2 & 4 (holding a ball during both a cognitively loaded and non-cognitively loaded judgment task). Participants were given a brief break between the two sets of experimental trials. During this break, in a dark room, participants viewed 15 nature pictures for 15 seconds each - an experience that has been shown to help participants recover from fatigue (Berto, 2005). In doing this, I aimed to refresh participants from their first judgment task such that the effects of fatigue (either from judging the images or a cognitive load or both) would not carry over to their second round of the experiment.

In order to minimize demand affects of threat context (holding a gun vs. a ball), the experimenters ensured that participants were not aware of the presence of the other object (i.e., participants who held a plastic Wii gun were not aware that other participants were asked to hold a foam ball and vice versa). In addition, the script of the directions ambiguously uses the word "object" rather than "gun" or "ball". Prior to being presented with the experimental stimuli, participants were shown 20 practice images that simply contained an arrow (pointing up or down) and asked to use their dominant hand to raise or lower their object in reaction to the direction of the arrows. The purpose of these 20 practice trials was to expose participants to the general mechanics of interfacing with the computer, mouse, etc.

Next, participants were presented with the 76 images (involving threatening and non-threatening individuals) and instructed to raise or lower their object as function of whether they believed each image contained a threat (raise the ball/gun) or a non-threat (lower the ball/gun). Participants were instructed to be as accurate as possible throughout the task. Before viewing the 76 images, participants in the cognitive load condition viewed an 8-digit number, and were told that they would be asked to freely recall this number after making judgments about 76 images. Participants in the non-cognitive load conditions simply began viewing the 76 images.

Participants were instructed to hold their object over the mouse to indicate their readiness to begin the judgment task. As they looked at the computer screen, a fixation point ("+") appeared in the center of the screen, followed by a background image (color squares), followed by a target image depicting a person holding either a gun or a shoe. Each target image was presented for 850ms (consistent with previous research using these stimuli; Witt & Brockmole, 2012). Participants were instructed to click the mouse and then make a motion with their object (i.e., raise or lower the object) to indicate their judgment about the image. The lag between an image being presented and the click of the mouse button signified the reaction time of the participant. Each reaction time was recorded by the computer program. However, the computer could not record the direction of participants' motions. As such, experimenters, who were blind to the screen, observed each participant and recorded whether he/she raised or lowered his/her object for each of the 76 trials. Upon the completion of the judgment task, participants completed a survey regarding their mood, ability to complete the task, rating of the images as threatening, and several questions regarding their experience with guns (e.g., "Have you ever been to a gun range to shoot?", "Do you own a gun permit?"). Upon completion of the surveys, the experimenter debriefed the participants and granted them course credit.

Measures

Conditional Reasoning Test for Aggression (CRT-A; James & McIntyre, 2000; James et al., 2004, 2005). I assessed implicit aggression with the CRT-A during part one of the study. The CRT-A consists of 22 inductive reasoning items, each with an inductively logical aggressive response and an inductively logical response based on non-aggressive or socially adaptive ideology and reasoning. The CRT-A measures the justification mechanisms described in the introduction of this paper. Each aggressive response was rewarded a “+1” and each non-aggressive response was scored with a “0” such that higher scores indicated implicit aggressive personality. Respondents who select a high number of AG alternatives (i.e. 7.0 = top 12%) to solve the CR problems bear high scores on this scale and, therefore, the JMs associated with implicit aggression likely influence these individuals' thoughts and behaviors. A low score on the CRT-A indicates the absence of an implicit cognitive system to justify aggression and the unlikelihood of these individuals engaging in aggressive acts. According to the recommendations of the CRT-A manual (James & McIntyre, 2000) as well as recent literature regarding the CRT-A (James & LeBreton, 2012), I removed participants who had more than 4 illogical answers - indicating their confusion or lack of attention to the test, thus calling to question the use of their CRT-A scores (see also the description of Data Screening in the Results section). Finally, the CRT-A was collected "on-line" which was consistent with previously successful studies (e.g., Krasikova, 2011) but inconsistent with the test manual (which recommends proctored, controlled data collection). The decision to proceed with on-line CRT-A was based on (a) the success of several recent studies using CRT-A online, and (b) the desire to separate the measurement of implicit aggression from the threat detection exercises.

Buss-Perry Aggression Questionnaire (BPAQ-SF; Diamond & Magletta, 2006). I asked participants to self-report on their aggression on this 12-item, 5-point, Likert-type measure, with responses ranging from 1 ("very unlike me") to 5 ("very like me"). This measure includes items such as "I often find myself disagreeing with people."

Mini-International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006). I also included additional measures of personality in the online survey. These measures were included simply to establish evidence of divergent validity for scores on the CRT-A and the BPAQ. I assessed the global traits of the Five-Factor Model using the 20-item Mini-IPIP questionnaire which includes 4 items per Big Five trait, each paired with a 5-point Likert-like response scale ranging from 1 ("very inaccurate") to 5 ("very accurate").

Conditional Reasoning Test for Relative Motive Strength (CRTA-RMS; James 1998: updated version). I also administered another conditional reasoning test associated with an individual's implicit achievement motive (AM) or fear of failure motive (FF) in order to further establish evidence of divergent validity for scores on the CRT-A and the BPAQ. Respondents earned a "+1" for every AM alternative that they selected and a "-1" for every FF alternative that they selected. I summed these scores separately for each scale for a separate composite score on the FF and AM scales.

Demographics questionnaire. I asked participants to report on demographic information such as sex, age, ethnicity, and gun usage.

Results

Data Screening and Cleaning

Following the recommendations of Tabachnick and Fidell (2013), I screened and cleaned my original data set ($N = 405$) , prior to undertaking formal tests of my hypotheses. As a first step in data screening, I calculated the validity scale for the CRT-A. This scale examines the frequency with which respondents endorsed illogical solutions to the inductive reasoning problems. As noted in the test manual (James & McInytre, 2000), the CRT-A is written at a 6^{th} grade reading level. Thus, endorsing multiple distractor/illogical answer choices indicates (a) the respondent had difficulty reading at this level, or (b) he/she was not paying close attention to the test. Irrespective of the reason for selecting distractors, endorsing 4 or more distractors has been recommended as a cut-off for invalidating a respondent's test protocol. A total of 26 participants failed the validity scale and thus were excluded from further analyses. Data were also screened for univariate and multivariate outliers using the protocols recommended by Tabachnick and Fidell (2013). Although a few participants obtained values consistent with being either a univariate or multivariate outlier, a closer examination of their data did not reveal anything to indicate that their aberrant scores were driven by membership in another population. Consequently, no participants were excluded on the basis of the outlier analysis. Thus, I proceeded with hypothesis testing with a final sample size of $N = 378$.

A brief visual inspection of the reaction time (RT) data for both the load and non-load conditions, revealed values exceeding 2, 3, and even 4 seconds (note: the image was only displayed for 850ms and the median response time was 668.88ms for the load condition and 653.67ms for the no load condition). Based on my experience, these deviating values appear to have been engendered by technical mishaps during an experimental trial (e.g., the participant failing to click the mouse prior to raising or lowering the gun or ball). Such mishaps resulted in erroneous estimates of RT. Thus, consistent with other reaction time studies (e.g., Kleider et al., 2010), I recoded RTs to individual stimuli (i.e., individual images) that were +/- 2.5 standard deviations from the mean RT for that stimuli. Specifically, I recoded a participant's extreme RT score on any given stimuli to his or her mean RT score across the other stimuli. I imputed mean values separately for the load and no load conditions.

Estimation of Bias and Sensitivity

In accordance with other studies using similar stimuli (cf. Correll et al., 2002; Witt & Brockmole, 2012), I calculated estimates of response bias and sensitivity. These statistics use the information obtained from classic signal detection theory hit rates and false alarm rates (see signal detection theory: Tanner & Swets, 1954). Specifically, I measured response sensitivity using the *A* statistic (Zhang & Mueller, 2005) which typically assumes values ranging from .5 (chance discrimination) to 1 (perfect discrimination), and the minimum possible value is 0. Values less than .5 are typically the result of sampling error and/or confusion/lack of attention on the part of the participant (Stanislaw & Todorov, 1999). I measured response bias using the *B″* statistic (Grier, 1971). Measures of *B″* compute negatively-signed *B″* values indicating a bias toward responding that a threat was “present” whereas positively-signed *B″* values indicate a bias toward responding that a threat was “absent.” *B’’* values close to zero indicate the absence of a response bias. As I noted earlier in the introduction[1], for ease of interpretation, I recoded *B’’* values so that positively-signed values (rather than negatively-signed values) indicate a bias to respond "threat present." Finally, I followed the recommendations of Macmillan and Kaplan (1985) and applied a transformation to the data in those instances in which participants had either perfect hit rates (1.0) or no false alarms (0.0).

Given the challenges associated with testing interaction effects, especially when one or more of the predictor variables are not experimental in nature (e.g., personality), I followed published recommendations for improving the statistical power for detecting interaction effects by rebalancing Type I and Type II errors (cf. Bing, LeBreton, Davison, Migetz, & James, 2007; Champoux & Peters, 1987; Chaplin, 1991; Cohen, 1988; McClelland & Judd, 1993). Specifically, I adopted a slightly more liberal critical alpha of .10 which was formally implemented in my tests of interaction hypotheses via one-tailed significance testing at critical alpha = .05. Such a relaxed alpha was deemed acceptable for my tests for interaction effects because the evidence needed to support an interaction hypothesis is only obtained when both (a) the interaction effect is significantly different from zero, and (b) the pattern of slopes conform to a very specific a priori prediction.

Generally speaking, I found limited support for my hypotheses. Specifically, implicit and explicit aggression had an effect on the strength of the relationship between threat context and threat detection bias, but not on sensitivity. Additionally, I did not detect the three-way interaction between cognitive load, threat context, and implicit aggression in predicting bias. However, I did find support for these three factors predicting sensitivity. In the following sections, I explain the results of each hypothesis and later, I discuss possible explanations for my findings.

Hypothesis 1: **Not supported**. My analysis of response bias (i.e., *B″*) failed to replicate prior work in this area by Witt and Brockmole (2012). Results for Hypothesis 1 (H1) can be found in Table 2. To test H1, I conducted a mixed model analysis of covariance (ANCOVA) in which bias was the dependent variable (estimated within subjects, under conditions of load and no load), threat context was manipulated between-subjects, and implicit aggression served as a continuous, between-subjects predictor (modeled as a covariate in the analyses). I did not find support for H1 such that the analysis did not reveal a significant difference in response bias - the extent to which one response is more probable than another - across threat context. Compared to individuals holding a ball, individuals holding a gun did not exhibit a greater bias to respond "threat present," $F(1, 374) = .79$, $p > .05$, $\eta^2 = .00$ ($M_{\text{hold-gun}} = .27$, $SD = .27$; $M_{\text{hold-ball}} = .22$, $SD = .27$). As I noted earlier in my description of the threat detection indices, values of *B″* range from -1.0 to 1.0 and I recoded *B″* values such that values greater than 0.0 correspond to a bias to report threats. Thus, values of .27 and .22 appeared to indicate a general tendency (i.e., a bias across both conditions) for participants to report threats.

Hypotheses 2 and 3: **Not supported**. For Hypotheses 2 and 3, I examined the influence of cognitive load on the relationship between threat context and threat detection bias (H2) and sensitivity (H3). Results for Hypotheses 2 (H2) can be found in Table 2 and results for Hypothesis 3 (H3) can be found in Table 3. To test H2, I examined the results for the mixed models ANCOVA described above. I did not find support for Hypothesis 2 such that *B″* was not significantly influenced by cognitive load, $F(1, 374) = 1.03$, $p > .05$, $\eta^2 = .00$ (*M* hold-gun load = .27, *SD* = .29; *M* hold-ball load = .21, *SD* = .29; *M* hold-gun no load = .26, *SD* = .29; *M* hold-ball no load = .22, *SD* = .29). Thus, it appeared that all participants had a slight bias to report threats, irrespective of threat context.

For H3 (see Table 3), I ran a similar mixed models ANCOVA as H2, replacing the within subjects variable of *bias* with *sensitivity* - comprised of a load and no load condition. I did not find support for H3. Although a statistically significant interaction was detected ($F(1, 374) = 2.78$, $p < .05$, $\eta^2 = .01$), graphing the results of this effect yielded a pattern of slopes that were inconsistent with my a priori predictions. Specifically, it appeared that individuals who held a *ball* were slightly more likely than individuals holding a gun, to exhibit lower *A* scores (*M*hold-gun load = .95, *SD* = .07; *M*hold-ball load = .95, *SD* = .08; *M*hold-gun no load = .95, *SD* = .07; *M*hold-ball no load = .95, *SD* = .08). This finding was not necessarily surprising, particularly in light of the lack of differences among the mean values - all closely approaching 1.0 (across conditions) - indicating participants (on average) were almost perfect in their ability to distinguish threats from non-threats.

Hypotheses 4-6: **Not supported**. Contrary to my predictions, I did not find support for Hypotheses 4, 5, or 6. I hypothesized that the motive to aggress would be related to threat detection bias. To test Hypothesis 4a (H4a: see Table 2), I conducted a mixed model ANCOVA with bias as the within subjects variable, categorized by load vs. no load, threat context as the between-subjects factor, and implicit aggression included as a between-subjects covariate. I tested H4b similarly, replacing implicit aggression with explicit aggression as the covariate (see Table 4). I did not find that B'' was significantly related to implicit aggression (H4a), $F(1, 374) = .73$, $p > .05$, $\eta^2 = .00$, nor by explicit aggression (H4b), $F(1, 374) = 2.82$, $p > .05$, $\eta^2 = .01$. Another way to examine these hypotheses is to look at the bivariate correlations between aggression type and an overall measure of bias (collapsed across load conditions). For H4a, implicit aggression did not significantly correlate with bias ($r = -.03$, $p = .53$). Explicit aggression also failed to correlate with bias (H4b: $r = -.06$, $p = .19$). Thus, aggression (both implicit and explicit) did not influence individuals to report threat.

Results for Hypotheses 5a and 5b (H5a and H5b) can be found in Tables 3 (H5a) and 5 (H5b). I did not find support for Hypothesis 5a or 5b such that implicit aggression (H5a), $F(1, 374) = .16$, $p > .05$, $\eta^2 = .00$, and explicit aggression (H5b), $F(1, 374) = .03$, $p > .05$, $\eta^2 = .00$, were not related to sensitivity scores. For H5a, implicit aggression did not significantly correlate with sensitivity ($r = -.04$, $p = .41$). Explicit aggression also failed to correlate with sensitivity (H5b: $r = -.03$, $p = .55$). Thus, aggression (both implicit and explicit) did not influence individuals' ability to discriminate among stimuli. One explanation for this finding may very well be the lack of variability in the sensitivity measure. Specifically, 75.7% of the A scores ranged from .97 to 1.0, and these ranges clearly did not covary with aggression. I further discuss these implications below.

Finally, I did not find support for Hypotheses 6a and 6b such that neither implicit aggression (H6a: see Table 6) nor explicit aggression (H6b: see Table 7) were related to faster RTs. To test H6a, I conducted a mixed model ANCOVA with RT for perceived threats (relating to any time the participant raised their object, indicating that they believed the image to be a threat) as the within subjects variable, categorized by load vs. no load, threat context as the fixed factor, and implicit aggression as the covariate. I tested H6b similarly, replacing (a) implicit aggression with explicit aggression as the independent variable, and (b) RT to actual threats (RTs relating to "gun" stimuli) as the dependent variable - rather than RT to *perceived* threats. Implicit aggression did not significantly predict RT for stimuli deemed as threatening, $F(1, 374) = .01$, $p > .05$, $\eta^2 = .00$, and explicit aggression did not significantly predict RT for threatening stimuli (i.e., images of guns), $F(1, 374) = 1.61$, $p > .05$, $\eta^2 = .00$. For H6a, implicit aggression did not significantly correlate with RT ($r = .02$, $p = .64$). Explicit aggression also failed to correlate with RT (H6b: $r = .07$, $p = .17$).

Hypotheses 7-9: **Partially supported**. The results of my analyses were generally consistent with H7a (see Table 2) – implicit aggression appeared to strengthen the relationship between threat context (holding a gun) and bias, $F(1, 374) = 3.01$, $p < .05$, $\eta^2 = .01$. Thus, implicit aggression influenced individuals to respond "gun present" while they held a gun (see Figure 2). I also found support for H7b (see Table 4) – explicit aggression appeared to strengthen the relationship between threat context and bias, $F(1, 374) = 6.67$, $p < .05$, $\eta^2 = .02$, such that as relationship between threat context and bias got stronger as explicit aggression score increased (see Figure 3). These results are particularly important in light of the real-life implications that I discussed in the introduction. Specifically the results for H7a and H7b imply that aggressive individuals - both armed forces personnel and non-armed forces individuals who carry guns - can have a bias to sense threats. This bias can result in harming individuals who do not pose a threat - a consequence that could mean life or death for the perceived threat. I further discuss these implications below.

Results for Hypotheses 8a and 8b (H8a and H8b) can be found in Tables 3 (H8a) and 5 (H8b). H8a was not supported – implicit aggression failed to strengthen the relationship between threat context (holding a gun) and sensitivity, $F(1, 374) = 1.67$, $p > .05$, $\eta^2 = .00$. I also did not find support for H8b such that explicit aggression failed to strengthen the relationship between threat context and sensitivity, $F(1, 374) = .85$, $p > .05$, $\eta^2 = .00$. As such, neither implicit nor explicit aggression influenced individuals' ability to discriminate threatening from non-threatening stimuli as a function of threat context.

Results for Hypotheses 9a and 9b (H9a and H9b) can be found in Tables 6 (H9a) and 7 (H9b). I did not find support for H9a such that I did not find a difference in the relationship between RTs and threat context as a function of differences in implicit aggression, $F(1, 374) = .08$, $p > .05$, $\eta^2 = .00$. Thus, implicit aggression did not influence individuals' RTs of threat responses differently when holding a gun. I also failed to detect a significant interaction between threat context and explicit aggression (H9b), $F(1, 374) = 2.65$, $p > .05$, $\eta^2 = .01$.

Hypotheses 10 and 11: **Not supported**. Support was not obtained for Hypotheses 10 (H10) or 11 (H11). I hypothesized that the motive to aggress would strengthen the relationship between cognitive load and threat detection bias. I did not find support for Hypothesis 10 (see Table 2) such that *B″* was not affected by implicit aggression for those who were cognitively loaded, $F(1, 374) = .98$, $p > .05$, $\eta^2 = .00$. I also did not find support for H11 (see Table 3) in that *A* was not influenced by implicit aggression for those who were cognitively loaded, $F(1, 374) = .01$, $p > .05$, $\eta^2 = .00$.

Hypothesis 12: Not supported. In Hypothesis 12, I proposed that cognitive load would interact with both threat context and the implicit motive to aggress in the prediction of threat detection bias, such that the two-way interaction between implicit aggression and threat context in predicting bias, would be stronger (i.e., exacerbated) when participants were under conditions of cognitive load, while the interaction of implicit aggression and threat context in the prediction bias was expected to be weaker when participants were not placed under cognitive load. I did not find support for H12 such that *B″* was not predicted by the three-way interaction, $F(1, 374) = .93$, $p > .05$, $\eta^2 = .00$ (see Table 2). Thus, cognitive load did not interact with threat context and the implicit motive to aggress to predict enhanced threat detection bias.

Hypothesis 13: Supported. The results were generally consistent with my final hypothesis (H13), which proposed that cognitive load would interact with both threat context and the implicit motive to aggress in the prediction of sensitivity, such that the two-way interaction between implicit aggression and threat context in predicting sensitivity, will be stronger (i.e., exacerbated) when participants are under conditions of cognitive load, while the interaction of implicit aggression and threat context in the prediction sensitivity is expected to be weaker when participants are not placed under cognitive load.

Results revealed a significant three-way interaction of cognitive load X threat context X implicit aggression in the prediction of sensitivity, $F(1, 374) = 3.12$, $p < .05$, $\eta^2 = .01$ (see Table 3). This effect remained after imposing a stricter scoring procedure on the CRT-A (taking out individuals with > 2 illogical answer choices as opposed to 4), $F(1, 345) = 4.64$, $p < .05$, $\eta^2 = .01$. Thus, even after removing 29 participants from the data set who have > 2 illogical answer choices on the CRT-A (resulting in an N = 349), the results continued to be consistent with focal hypothesis of this study. In graphing this interaction (Figures 4 and 5), I found that cognitive load, implicit aggression, and threat context appear to influence sensitivity, such that those with higher aggression scores, who are cognitively loaded and who hold a gun, had a lower ability to discriminate among the threatening and non-threatening images. As I predicted, there was no affect of implicit aggression nor threat context on sensitivity for conditions in which participants did not experience a cognitive load.

Discussion

Through the present study, I sought to enhance our understanding of the antecedents of threat detection. I built upon the previous research by simultaneously examining both (1) implicit and explicit aggressive personality in conjunction with the (2) contextual factors of (a) threat context and (b) cognitive load, and whether these factors exhibited both main effects and interactive effects on threat detection bias or sensitivity. My results supported the notion that threat context and aggression interacted to predict enhanced threat detection bias, while cognitive load, implicit aggression, and threat context interacted to predict sensitivity. In the following sections, I discuss explanations for my findings.

For the first hypothesis, I attempted to simply replicate the earlier findings of Witt and Brockmole's (2012). However, I were unable to conclude that levels of threat bias differed across threat context (i.e., there were no significant differences in bias levels as a function of holding a gun vs. holding a ball). There are several potential explanations for why I was unable to replicate their results. The first relates to the participants' gun usage. Roughly 29% of the sample included participants who had been to a gun range at least once, 14% of the participants own a firearm, and 18% of the participants have taken a instructional shooting course. As such, my attempt to mimic a weapon with a white, plastic, Wii gun might have lacked a degree of authenticity. For those individuals with prior firearms experience, the use of a plastic toy gun may have simply failed to elicit the sensation of being in possession of a deadly weapon. However, given that previous studies sampled from this same university subject pool this explanation may be suspect.

I did not find support for Hypothesis 2 (i.e., cognitive load did not increase the likelihood of individuals responding "gun present"). In addition, I did not find support for Hypothesis 3 such that cognitive load did not strengthen the relationship between threat context and sensitivity in the direction that I hypothesized. This was surprising, given that previous research has found that self-regulation activities (mental control of thoughts) may produce subsequent failures in self-regulation/self-control (Muraven, et al., 1998). Though other researchers who relied on a "shoot threats/don’t shoot non-threats" paradigm found that individuals with lower working memory capacity were more likely to (1) shoot unarmed/non-threatening targets and (2) fail to shoot armed targets (Kleider, et al., 2010), the results of the current study failed to reach similar conclusions.

Though the "cognitive load" manipulation (memorizing an 8-digit number for subsequent free recall) has been found to engender a high cognitively-loaded experience (Gilbert & Hixon, 1991; Macrae, et al., 1993), one explanation for the null findings for both Hypotheses 2 and 3, was that the "cognitive load" manipulation did not work as I expected. There is some evidence consistent with this conclusion. Specifically, I examined responses to the three manipulation check questions asked of participants at the end of each image-judgment series; participants were asked to rate the following questions on a scale ranging from 1 (not at all) to 7 (extremely): (1) did you feel like this task was difficult?; (2) did you feel like this task was distracting?; (3) did you feel like this task was overwhelming?

My analysis revealed a significant difference between the mean scores for these manipulation check questions as a function of cognitive load with a higher mean score being observed in the load condition ($M = 2.83$) compared to the no load condition ($M = 2.31$; $t(377) = 9.47$, $p < .01$; $d = 0.49$). Thus, it seems reasonable to infer that the cognitive load manipulation did in fact make the task *relatively* more taxing across load and no load conditions. However, in an *absolute* sense, the mean levels for both conditions were still less than 3 on the 7-point scale. This suggests that neither condition was viewed as particularly challenging/taxing. Instead, both conditions were evaluated as non-taxing (i.e., easy). These results stand in contrast to previous studies which reported that this memorization task "has consistently been shown to debilitate people's processing capacity" (p. 80, Macrae et al., 1993). Thus, given that participants did not find the cognitively loaded conditions particularly difficult, the null results with respect to many of the hypotheses involving cognitive load are unsurprising.

Contrary to my predictions, I did not find support for Hypotheses 4, 5, or 6. Thus, neither type of aggression predicted bias nor sensitivity. Also, neither type of aggression was related to RTs. Based on the implicit aggression literature, I expected that implicit aggression would lead to unfavorable outcomes such that implicitly aggressive individuals would display a heightened bias to see threats and lack the ability to discriminate between threats and non-threats, compared to non-implicitly aggressive individuals. The importance of implicit aggression in predicting a heightened predilection to perceive threats in the environment, and to react to threats in a manner consistent with aggression (i.e., raising a gun), is consistent with other research (e.g., James & McIntyre, 2000; James et al., 2005), as well as related research examining explicit features associated with implicit aggression (e.g., anger: van Honk, et al., 2001; revenge-mindedness: Becker, et al., 2011).

One explanation for the null findings of Hypotheses 4 through 6, is that the situation was not congruent for the motive to aggress to influence behavior. Consequently, even individuals who endorsed items consistent with strong *hostile attribution* and *victimization by powerful others* biases, were not influenced by those biases during the threat detection experiment. I discussed this possibility in the introduction: aggressive behavior has a low base rate (Frost, 2005) and James et al. (2005) found that implicitly aggressive participants would not aggress unless they were provoked. Thus, perhaps there was something about the stimuli used in the current study that rendered them ineffective at activating the motive to aggress (i.e., the "threatening" images containing a plastic gun could have seemed non-threatening to participants, particularly those who have handled real guns, which in my case is over one fourth of the sample).

Furthermore, with respect to sensitivity, one potential limitation is the restriction of variability in scores observed in my sample. As I mentioned above, roughly 76% of the sample had scores of .97 or above (1.0 indicates perfect discriminability among stimuli). In hindsight, I wish I had more closely considered the results of Witt and Brockmole (2012), who also found that sensitivity was not affected by threat context alone and had mean values that were consistent with my means.

This explanation, along with the explanation for the null results for cognitive load in Hypothesis 2, would also explain the null findings for Hypotheses 10-12, which indicated that implicit aggression did not strengthen the relationship between cognitive load and bias (H10) or sensitivity (H11). In addition, cognitive load did not interact with (a) threat context and (b) implicit aggression to predict bias (H12).

Thus, in addition to producing only a minor cognitive load effect, perhaps the images and the context of identifying threats was not a powerful enough situation to trigger the implicit motive to aggress. Thus, as closely as I attempted to replicate both the stimuli (Correll et al., 2002; Witt & Brockmole, 2012) and cognitive load manipulation (Gilbert & Hixon, 1991; Macrae, et al., 1993), I were unable to find support for these hypotheses.

Though I found support for Hypotheses 7a and 7b (H7a and H7b), I did not find support for Hypotheses 8 or 9. Thus, both implicit (H7a) and explicit (H7b) aggression strengthened the relationship between threat context and threat detection bias. However, neither type of aggression strengthened the relationship between threat context and sensitivity (H8a and H8b), or threat context and RT (H9a and H9b).

My original impressions regarding implicit aggression were supported by the analyses: in a specific (i.e., threat-inducing) situation, implicit aggression influenced those who held a gun, to respond "threat present." Additionally, it appears that explicit aggression strengthened the relationship between holding a gun and threat detection bias. As I mentioned above, it is not surprising that neither type of aggression failed to influence sensitivity, because the sensitivity measure lacked variability.

Concerning the pattern of null findings related to RT, (particularly Hypotheses 6a, 6b, 9a, and 9b) it may be useful to consider the timing of my study's stimuli. Replicating Witt and Brockmole's (2012) study, stimuli of threatening and non-threatening images were depicted on a computer screen for 850ms and the next picture did not appear until participant judged the image as threatening vs. non-threatening (by clicking the mouse and making an arm motion). Thus, it is possible that by presenting the stimuli for nearly an entire second, participants were afforded *too much* time to make their choice, such that controlled and conscious processes were more instrumental in guiding behavior than their unconscious ones (primary threat detection and/or implicit aggression). Research by Baumann and Desteno (2010) is consistent with this concern. These researchers found that when individuals had more time to process decisions about potential threats, they overcame the heightened threat detection bias such that they were able to more accurately detect threats and non-threats (Baumann & Desteno, 2010). However, stricter time constraints compromised participant accuracy. Thus, future research may wish to consider restricting the timing of either (a) the stimuli, (b) the amount of time given to the participant to make a decision, or (c) both.

Alternatively, the lack of support for my hypotheses may not be a function of methodological issues, but instead may be theoretical in nature – namely, it is quite possible that my hypotheses were misguided and were not supported because they were inconsistent with the psychological bases of human behavior. My hypotheses were developed and induced based on my understanding of the extant literature related to threat detection, implicit personality, and information processing. However, it is possible that my predictions simply missed the mark.

A final explanation for the prevalence of null findings may be attributed to the idea that the three experimental variables in my study are most likely to influence threat detection tendencies when examined simultaneously (and interactively). There is some limited evidence for this final explanation. Specifically, I obtained support for the hypothesized three-way interaction of cognitive loaded X threat context X implicit aggression in the prediction of sensitivity to threats vs. non-threats (H13).

As I explained in the introduction, sensitivity is the result of an individual's hit rate (correctly identifying a threat) and their false alarm rate (incorrectly identifying an image as a threat, when the image is a non-threat). As such, individuals with low sensitivity scores could have had very high false alarm rates, very low hit rates, or both. Support for this hypothesis is very important because it was tested in a situation that is consistent with previous scenarios where there have been breakdowns in the threat detection processes (i.e., individuals holding weapons making split second decisions under cognitive distraction or duress). Thus, if cognitive load, holding a gun, and implicit aggression can lead to higher false alarm rates and/or lower hit rates, it benefits armed forces establishments to consider not only situational influences on threat detection (i.e., threat context, cognitive duress) but also how personality traits may work with these situational influences to impact the accuracy of threat detection processes. Prior to discussing the practical implications of my study, I first suggest directions for future research studies.

Future Research Directions

As I noted earlier, one potential limitation of the current study may have been problematic manipulations of my experimental variables (i.e., threat context; cognitive load). However, other threat detection studies, particularly those using guns as stimuli, have used anything from objects resembling a real gun (white plastic Wii gun; Witt & Brockmole, 2012) to computer keys associated with "threat" vs. "non-threat" (Becker et al., 2011; Baumann & Desteno, 2010; Correll et al., 2002; Kleider et al., 2010) as the "object" through which the participant makes judgments about threatening vs. non-threatening images. In the future, researchers may wish to consider using more ecologically valid stimuli to induce threat context.

Given the chance to replicate my study with different stimuli, it is unlikely that I would be allowed to use an actual, authentic hand gun on a college campus. However, the simple change of using a black or silver plastic gun might enhance the threat context to give the participant the feeling of holding an actual firearm. Another way I could enhance the ecological validity of my stimuli would be to use images containing real guns as other researchers have (Baumman & Desteno, 2010; Correll et al., 2002), instead of the black plastic gun depicted in my images. Another option for enhancing validity, would be to follow the Kleider et al. (2010) study that primed participants with a real shooting video. Prior to engaging in a shoot-threat task, Kleider et al. showed participants a real-life FBI training video that depicts a fatal shooting of a police officer, thus priming the situation for threats. Finally, collecting field data from police officers or soldiers would enable researchers to use actual firearms during a threat-detection scenario.

A potential limitation related to this latter recommendation is that, though I believe the basic cognitive processes examined in my study are relevant to both non-military and military populations, the current study did not explicitly sample from the latter population. Thus, future research studies would benefit from examining this particular population - perhaps beginning with new recruits who are experiencing basic firearms training. Specifically, if a similar three-way interaction predicting sensitivity is found for both novice and advanced soldiers, this would suggest that the current firearms training programs are not sufficiently preparing soldiers (or police officers) for discriminating threats from non-threats. However, if the three-way interaction was only found for novice recruits, this would suggest that the current training is effective in overcoming the potential compound effects of threat context, cognitive duress/load, and the motive to aggress (which one would hope occurs at even a lower base rate in populations containing individuals seeking to "protect and serve").

Though I used a manipulation that previous researchers found was successful at engendering a high-load (Gilbert & Hixon, 1991; Macrae, et al., 1993), the degree of cognitive load experienced in my sample was rather low and thus may not have been sufficient for influencing bias. Future research may wish to consider alternative cognitive load manipulations such as playing background noises and/or videos of a battle scene (Huttunen, Keränen, Väyrynen, Pääkkönen, Leino, 2011) while the participant makes judgments about images. Similar manipulations have been shown to result in decreased accuracy of individuals charged with determining the safety of simulated explosives (Villoldo & Tarno, 1984) and diminished performance of control operators (Hockey, 1986).

Practical Implications

Individuals in many states are regularly issued a concealed carry permit without being asked to demonstrate a proficiency with firearms or an understanding of basic firearms safety ("Indiana Concealed Carry Permit Information," 2014). For example, in Indiana, where almost 560,000 individuals own a concealed carry permit ("Firearms Licensing Statistics," 2014), none of these individuals were required to take a firearms safety course. Thus, the results of my study may generalize to many individuals having concealed carry permits, particularly given the that over one fourth of my sample reported owing a firearm. Through drawing this conclusion from my results, I am not necessarily advocating stricter licensure laws or gun possession laws. Rather, in light of my results, I do see a benefit (for both the gun-holder and others) in encouraging permit-holders to take a gun safety and/or an instructional shooting course, in which they would learn how threat context, cognitive distractions, and potential latent personality motives could potentially influence their ability distinguish threats. Organizations such as the International Defensive Pistol Association (IDPA) regularly hold shooting competitions that require individuals to make split second decisions concerning whether a stimuli (paper target) is a threat or a non-threat. These competitions are scored for both time and accuracy of threat discrimination. Thus, future researchers may also wish to consider sampling from organizations such as the IDPA, perhaps comparing the accuracy and/or reaction times of novice and expert shooters.

Building off of this latter recommendation, future research should also explore the potential for changing the latent biases associated with motives such as the motive to aggress. The support for both threat context and both types of aggression in predicting enhanced bias, however, could prove more difficult to "fix" with training or other methods. Though I suspect that it is possible to make individuals aware of their biases, systematically *changing* these biases (which, by definition, tend to operate unconsciously) may be a more challenging undertaking (cf. James & LeBreton, 2012; Westen, 1998).

I, again, stress the harmful nature of the motive to aggress. That is, the motive to aggress is defined as the motive/intent/desire to hurt or harm others. The definition of implicit aggression that I use, does not connote assertiveness; it is not social dominance; and it is not achievement orientation. Thus, relevant to armed forces establishments, I also would not expect aggressive individuals to follow orders during wartime to execute controlled violence following established rules of engagement. Rather, dispositionally aggressive individuals are likely to ignore rules of engagement or use of force policies and rely on their implicit biases to post-hoc justify their aggressive behaviors (James & LeBreton, 2010; 2012).

Consequently, police and military organizations may wish to make use of the practical nature of my findings by implementing interventions for minimizing error by individuals prone to threat detection bias and sensitivity. Whether interventions include pre-screening of personnel and selecting only the most accurate individuals for field work involving weapons, or making individuals aware of their potential implicit biases and teaching them how to overcome these biases, the critical nature of these occupations begs the awareness of such antecedents of threat detection inaccuracy.

Conclusion

Detecting threats quickly and accurately is a crucial ability for everyone and can be linked to evolutionarily adaptive information processing mechanisms. Detecting threats is especially relevant for armed forces personnel because of the critical implications for civilian safety as well as the reputations of armed forces establishments. Threat detection accuracy is also of crucial importance for civilians, particularly those who have received no formal weapon-training yet have elected to carry a firearm for personal protection. However, neither the situational nor the personal and motivational antecedents involved in our assessment of our environments for threats, are well-understood. The present study extended research and practice's understanding of the antecedents to threat detection bias by showing that (1) both implicit and explicit aggression can work interactively with threat context to predict a heightened bias to perceive threats and (2) threat context (holding a threatening vs. a non-threatening object), cognitive load, and the implicit motive to aggress may (interactively) contribute to the prediction of threat detection sensitivity and, more generally, threat detection inaccuracy.

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APPENDICES

Appendix A

Table 1

Means (M), Standard Deviations (SD), and Correlations Among Study Questionnaires

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. CR	4.88	2.25	–															
2. SR	2.13	.69	.13*	–														
3. *A* (L)	.95	.10	-.02	-.04	–													
4. *A* (NL)	.95	.11	-.01	.02	.19**	–												
5. *B"* (L)	.24	-.38	.01	.11*	.12*	.00	–											
6. *B"* (NL)	.24	-.41	.07	.05	.01	.12*	-.16**	–										
7. FA (L)	.08	.10	.03	.07	-.94**	-.19**	.08	.03	–									
8. FA (NL)	.08	.11	.05	.02	-.22**	-.95**	.04	.08	.25**	–								
9. Hit (L)	.95	.10	-.02	-.02	.97**	.17**	.26**	.05	-.89**	-.18**	–							
10. Hit (NL)	.95	.10	-.01	-.01	.20**	.98**	.06	.25**	-.19**	-.90**	.19**	–						
11. CR-AM	8.04	2.26	-.13**	-.10	.06	.03	-.13*	-.07	-.09	-.09	.04	.03	–					
12. CR-FF	3.64	1.95	.08	.10	-.10*	-.02	.11*	.03	.13*	.06	-.09	-.02	-.79**	–				
13. PA (L)	16.92	4.03	-.07	.11*	-.03	-.13*	.02	-.02	.05	.13*	-.01	-.14**	-.03	.03	–			
14. NA (L)	25.47	5.92	-.09	.06	.00	-.07	.00	.00	.02	.05	.02	-.07	.02	-.03	.73**	–		
15. PA(NL)	16.12	3.78	-.06	.03	-.03	-.15**	.01	.03	.02	.18**	-.01	-.15**	.03	.00	.65**	.49**	–	
16. NA (NL)	23.85	6.05	-.12*	-.02	.03	-.11*	-.02	.00	-.06	.11*	.04	-.11*	.03	-.05	.53**	.70**	.71**	–

Note. $N = 378$.*CR*: CRT-A; *SR*: self-reported aggression as measured by the Buss & Perry Aggression Questionnaire; *A (L)*: sensitivity measure for the load conditions; *A (NL)*: sensitivity score for the no load conditions; *B"*: bias score; *FA*: false alarm rate; *Hit*: hit rate; *CR-AM*: conditional reasoning test for achievement motivation score; *CR-FF*: conditional reasoning test for the fear of failure score; *PA*: positive affect score on the PANAS; *NA*: negative affect score on the PANAS.

*$p < .05$ (two-tailed).

Table 2

Mixed Model Analysis of Covariance for Threat Detection Bias

Source	*SS*	*df*	*MS*	*F*	η^2
Between-subjects					
Threat Context	0.14	1	0.14	0.79	.002
Implicit Aggression	0.13	1	0.13	0.73	.002
Threat Context X Implicit Aggression	0.54	1	0.54	3.01*	.01
Error	66.74	374	0.18		
Within-subjects					
Load	0.12	1	0.12	0.91	.002
Load X Threat Context	0.13	1	0.13	1.03	.002
Load X Implicit Aggression	0.13	1	0.13	0.98	.002
Load X Threat Context X Implicit Aggression	0.12	1	0.12	0.93	.002
Error	48.70	374	0.13		

Note. *Threat context* = gun vs. shoe; *Implicit aggression* = CRT-A test score; *Load* = cognitive load vs. no load.

*$p < .05$ (one-tailed tests were conducted for two and three-way interactions)

Table 3

Mixed Model Analysis of Covariance for Threat Detection Sensitivity

Source	*SS*	*df*	*MS*	*F*	η^2
Between-subjects					
Threat Context	0.02	1	0.02	1.58	0.00
Implicit Aggression	0.00	1	0.00	0.16	0.00
Threat Context X Implicit Aggression	0.02	1	0.02	1.67	0.00
Error	4.83	374	0.01		
Within-subjects					
Load	0.00	1	0.00	0.05	0.00
Load X Threat Context	0.02	1	0.02	2.78*	0.01
Load X Implicit Aggression	0.00	1	0.00	0.01	0.00
Load X Threat Context X Implicit Aggression	0.03	1	0.03	3.12*	0.01
Error	3.27	374	0.01		

Note. *Threat context* = gun vs. shoe; *Implicit aggression* = CRT-A test score; *Load* = cognitive load vs. no load.

*$p < .05$ (one-tailed tests were conducted for two and three-way interactions)

Table 4

Mixed Model Analysis of Covariance for Threat Detection Bias

Source	*SS*	*df*	*MS*	*F*	η^2
Between-subjects					
Threat Context	0.67	1	0.67	3.80	0.01
Explicit Aggression	0.50	1	0.50	2.82	0.01
Threat Context X Explicit Aggression	1.17	1	1.17	6.67*	0.02
Error	65.63	374	0.18		
Within-subjects					
Load	0.06	1	0.06	0.49	0.00
Load X Threat Context	0.00	1	0.00	0.00	0.00
Load X Explicit Aggression	0.07	1	0.07	0.55	0.00
Load X Threat Context X Explicit Aggression	0.00	1	0.02	0.01	0.00
Error	48.88	374	0.13		

Note. *Threat context* = gun vs. shoe; *Explicit aggression* = BPAQ-SF score; *Load* = cognitive load vs. no load.

*$p < .05$ (one-tailed tests were conducted for two and three-way interactions)

Table 5

Mixed Model Analysis of Covariance for Threat Detection Sensitivity

Source	*SS*	*df*	*MS*	*F*	η^2
Between-subjects					
Threat Context	0.01	1	0.01	0.86	0.00
Implicit Aggression	0.00	1	0.00	0.03	0.00
Threat Context X Explicit Aggression	0.01	1	0.01	0.85	0.00
Error	4.84	374	0.01		
Within-subjects					
Load	0.01	1	0.01	1.02	0.00
Load X Threat Context	0.00	1	0.00	0.03	0.00
Load X Explicit Aggression	0.01	1	0.01	0.88	0.00
Load X Threat Context X Explicit Aggression	0.00	1	0.00	0.02	0.00
Error	3.29	374	0.01		

Note. *Threat context* = gun vs. shoe; *Explicit aggression* = BPAQ-SF score; *Load* = cognitive load vs. no load.

**p* < .05 (one-tailed tests were conducted for two and three-way interactions)

Table 6

Mixed Model Analysis of Covariance for Reaction Time

Source	*SS*	*df*	*MS*	*F*	η^2
Between-subjects					
Threat Context	3142.81	1	3142.81	0.04	0.00
Implicit Aggression	1117.77	1	1117.77	0.01	0.00
Threat Context X Implicit Aggression	6736.50	1	6736.50	0.08	0.00
Error	30927192.26	374	82693.03		
Within-subjects					
Load	3740.11	1	3740.11	6.31*	0.02
Load X Threat Context	2221.05	1	2221.05	3.75	0.01
Load X Implicit Aggression	728.26	1	728.26	1.23	0.00
Load X Threat Context X Implicit Aggression	2614.08	1	2614.08	4.41*	0.01
Error	221669.73	374	592.70		

Note. *Threat context* = gun vs. shoe; *Implicit aggression* = CRT-A test score; *Load* = cognitive load vs. no load.

*p < .05 (one-tailed tests were conducted for two and three-way interactions)

Table 7

Mixed Model Analysis of Covariance for Reaction Time

Source	*SS*	*df*	*MS*	*F*	η^2
Between-subjects					
Threat Context	219700.86	1	219700.86	2.62	0.01
Explicit Aggression	134693.50	1	134693.50	1.61	0.00
Threat Context X Explicit Aggression	221951.92	1	221951.92	2.65	0.01
Error	29817296.53	373	83894.88		
Within-subjects					
Load	5107.79	1	5107.79	1.33	0.00
Load X Threat Context	65.23	1	65.23	0.02	0.00
Load X Explicit Aggression	10935.59	1	10935.59	2.85*	0.01
Load X Threat Context X Explicit Aggression	115.30	1	115.30	0.03	0.00
Error	1430391.14	373	3834.83		

Note. *Threat context* = gun vs. shoe; *Explicit aggression* = BPAQ-SF score; *Load* = cognitive load vs. no load.

*$p < .05$ (one-tailed tests were conducted for two and three-way interactions)

Appendix B

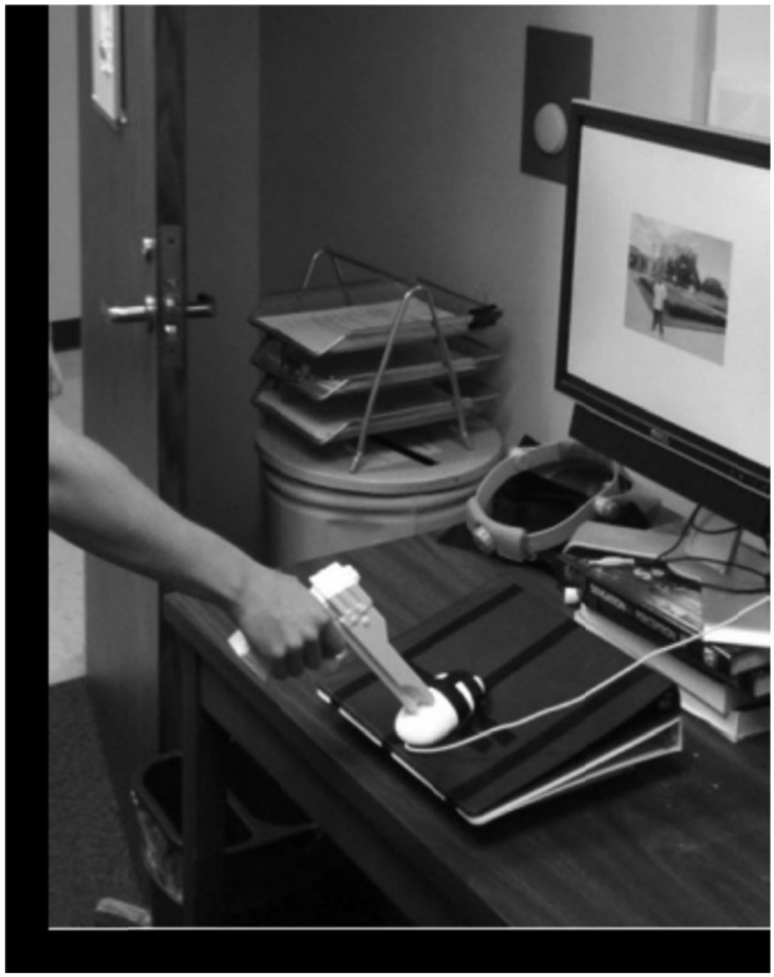

Figure 1. Experimental stimuli (adapted from Witt & Brockmole, 2012). Participants position a Wii gun (shown) or a rubber ball (not shown) on a mouse. Participants release their objects “up” if they perceived a threat and “down” if they perceived a non-threat.

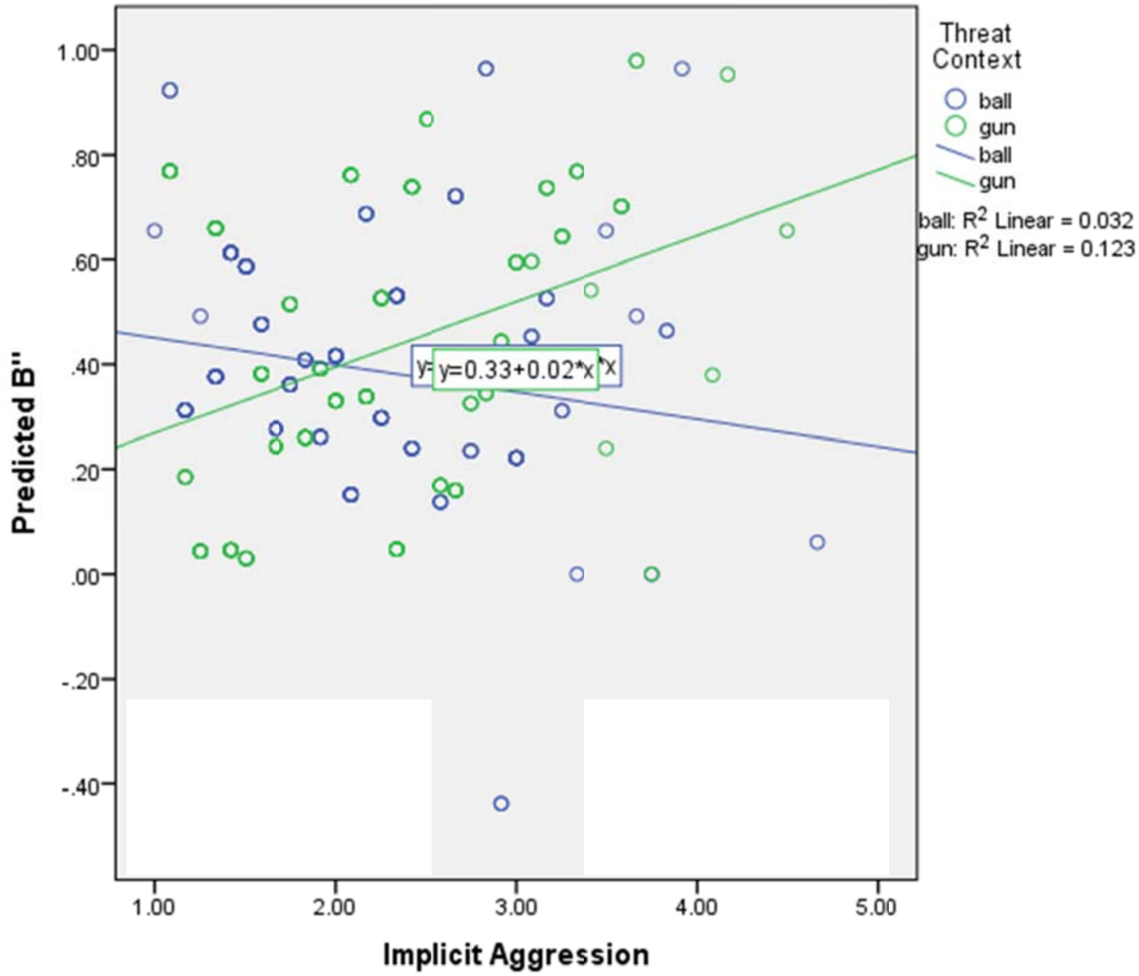

Figure 2. The moderating effect of implicit aggression on the relationship between threat context and threat detection bias. The interaction between implicit aggression (score on the CRT-A) and threat context (hold gun vs. hold ball) in the prediction of overall bias.

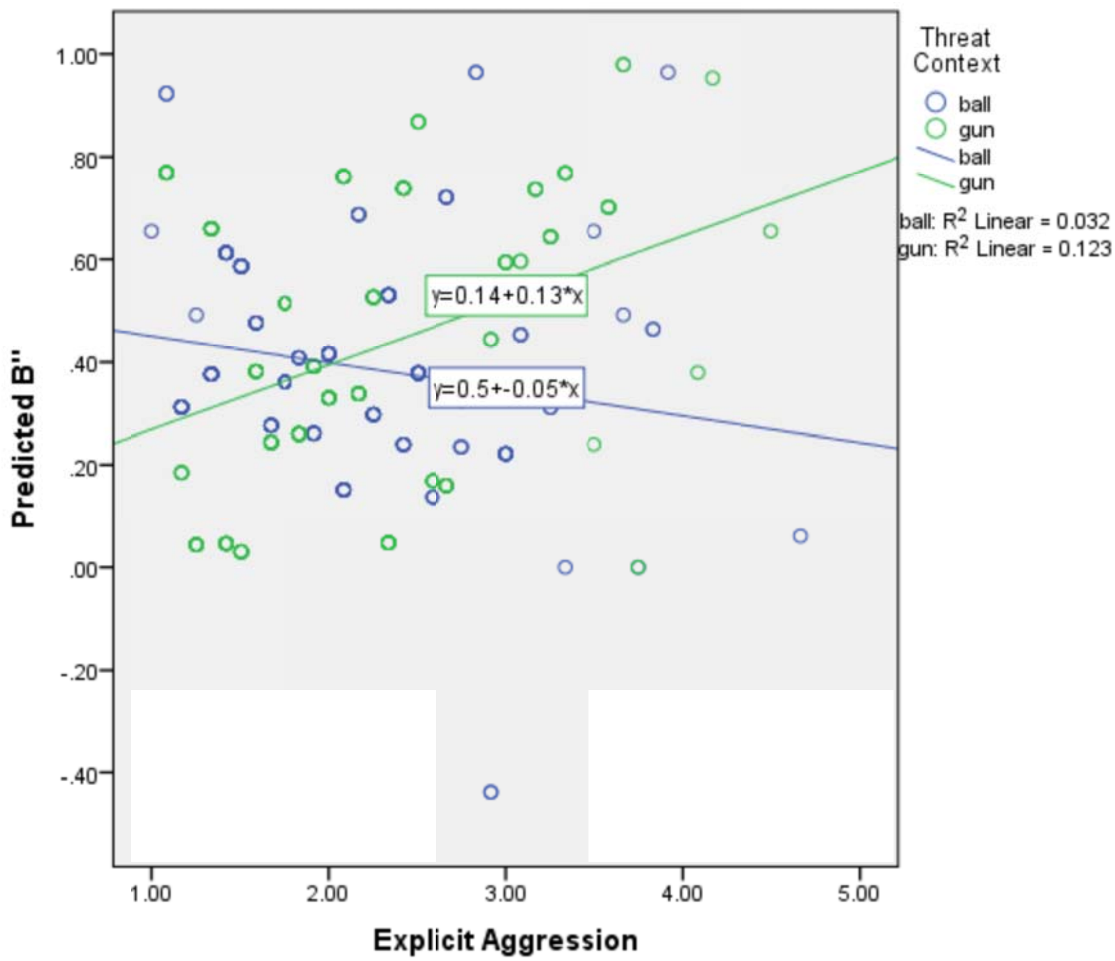

Figure 3. The moderating effect of explicit aggression on the relationship between threat context and threat detection bias. The interaction between explicit aggression (score on the BPAQ-SF) and threat context (hold gun vs. hold ball) in the prediction of overall bias.

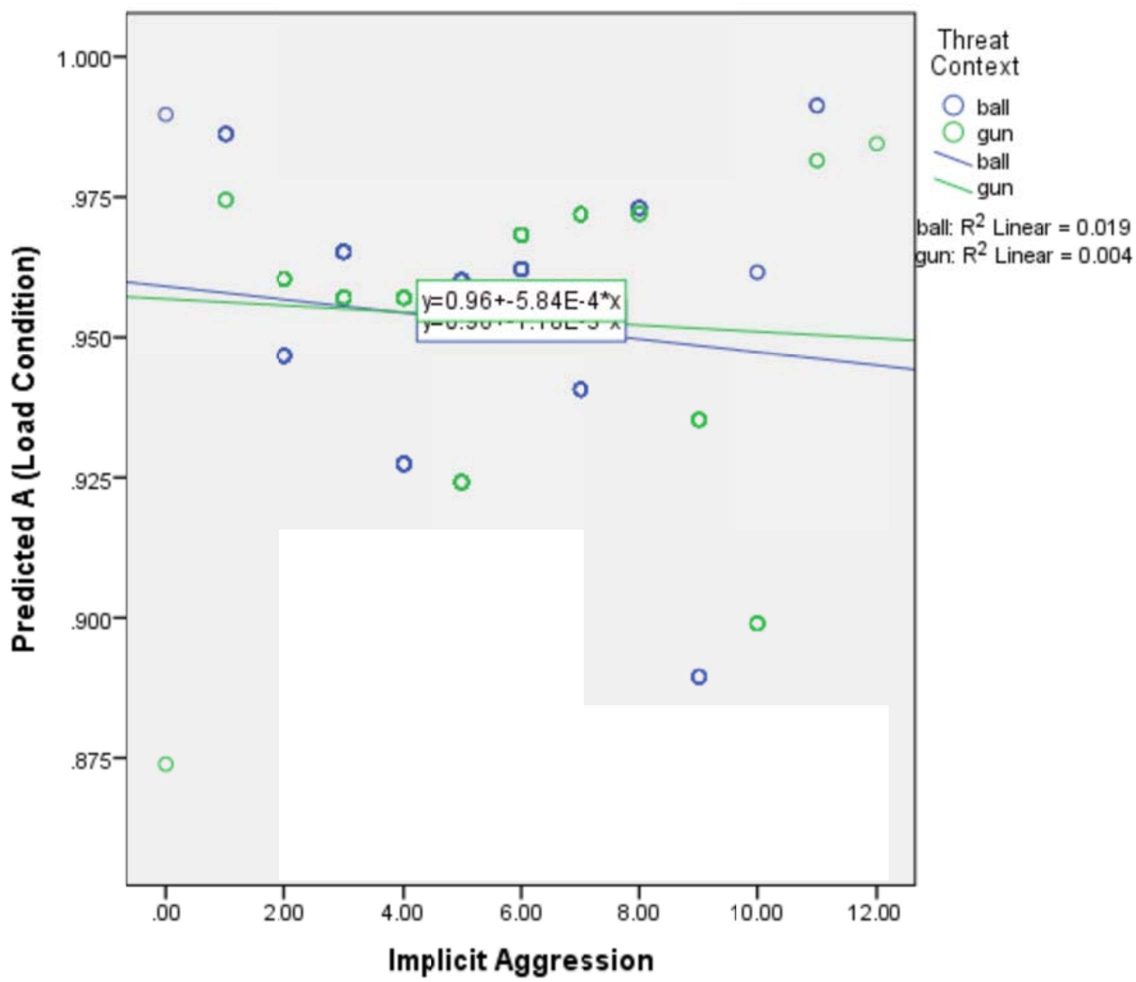

Figure 4. The moderating effect of threat context on the relationship between implicit aggression and sensitivity (load). The interaction between the implicit aggression (CRT-A) score and threat context (hold gun vs. hold ball) in the prediction of sensitivity for the load condition.

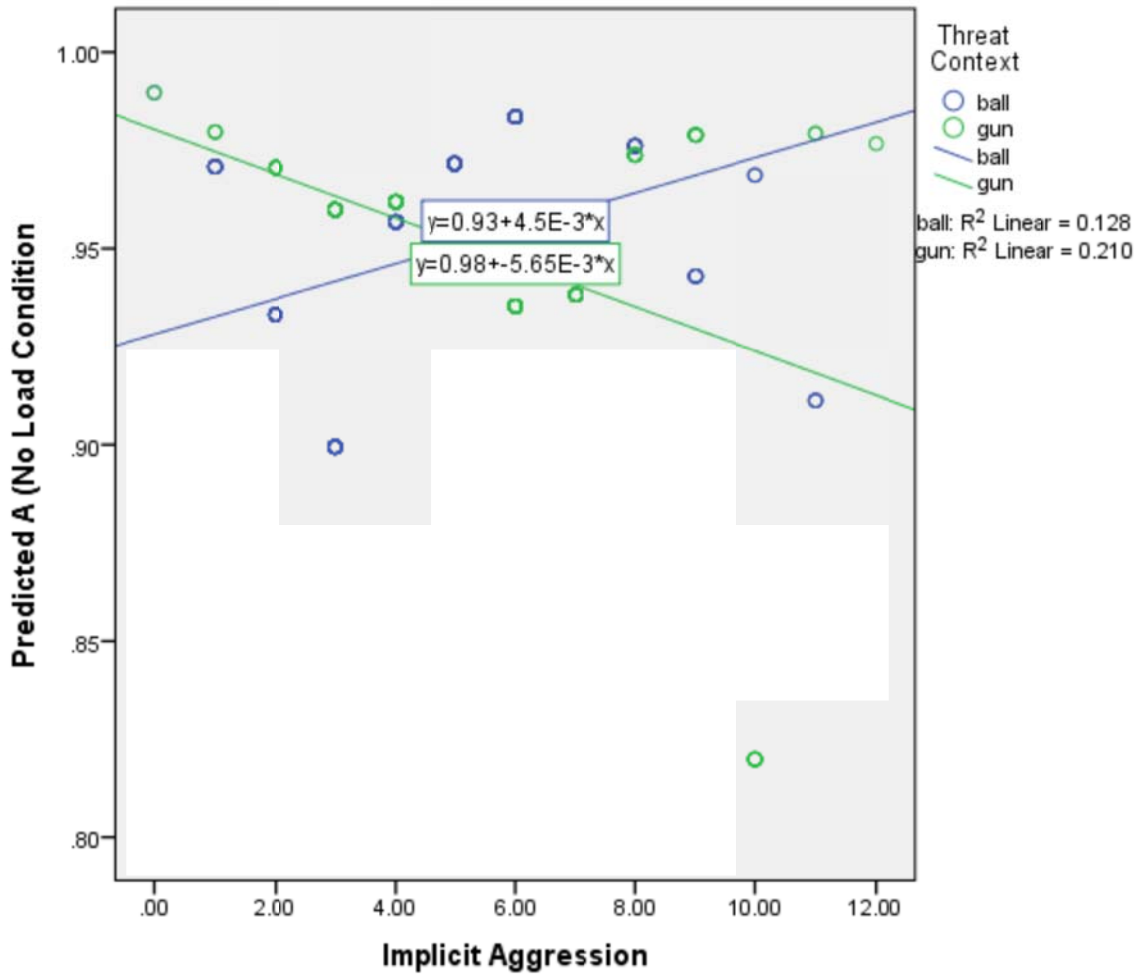

Figure 5: The moderating effect of threat context on the relationship between implicit aggression and sensitivity (no load). The interaction between the implicit aggression (CRT-A) score and threat context (hold gun vs. hold ball) in the prediction of sensitivity for the no-load condition.

VITA

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M.S. College of Health and Human Sciences, Purdue University – August 2012
Major: Industrial/Organizational Psychology

B.A. College of Liberal Arts and Sciences, Villanova University – May 2009
Majors: Psychology and English
Minor: Spanish

RESEARCH INTERESTS

My research interests involve exploring how the implicit component of personality is related to behavior. I am particularly interested in better understanding how "dark side" personality characteristics (e.g., psychopathy, aggression, narcissism) are related to counterproductive behaviors (e.g., retaliatory aggression; negative socio-emotional behaviors).

TEACHING INTERESTS AND EXPERIENCE

My teaching interests include graduate and undergraduate courses in industrial-organizational psychology and organizational behavior. I prepared and taught the upper-level, undergraduate Work Motivation and Job Satisfaction course during Purdue University's May-June semester. I have had teaching assistantships for a multivariate statistics graduate course, as well as for undergraduate courses in industrial/organizational psychology and work motivation.

GRANT FUNDING

Purdue Research Foundation Departmental Grant – Purdue University *July 2013-July 2014*

- Designed and wrote research proposal under the supervision of James M. LeBreton, Ph.D.
- Received year-long stipend and additional funding from the to conduct research examining the influence of hostile attribution bias on threat perception.

Bilsland Strategic Initiatives Fellowship – Purdue University *July 2012-August 2013*

- Designed and wrote research proposal under the supervision of James M. LeBreton, Ph.D.
- Received funding to complete research regarding the potential influences of implicit achievement motivation on graduate student performance and retention.

Undergraduate Research Grant – Villanova University *Fall 2007-Fall 2009*

- Designed and wrote research proposal under the supervision of Patrick Markey, Ph.D.
- Received stipend of $1,000 and additional funding of over $1,000 to complete psychology research regarding the potential moderating influences of motion capture controls and psychoticism on the effects of violent video games.
- Grant research led to article publication in *Computers in Human Behavior*.

PUBLICATIONS

Galic, Z., Scherer, K. T., & LeBreton, J. M. (2014). Examining the measurement equivalence of the Conditional Reasoning Test for Aggression across U.S. and Croatian samples. *Psychological Test and Assessment Modeling*, *56*(2), 195-216.

LeBreton, J. M., Scherer, K. T., & James, L. R. (2014). Corrections for criterion reliability in validity generalization: A false prophet in a land of suspended judgment. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, *7(4*).

Baysinger, M., Scherer, K. T., & LeBreton, J. M. (2014). Exploring the disruptive effects of psychopathy and aggression on group processes and group performance. *Journal of Applied Psychology*, *99*, 48-65.

Scherer, K. T., Baysinger, M., Zolynsky, D., & LeBreton, J. M. (2013). Predicting counterproductive work behaviors with sub-clinical psychopathy: Beyond the five factor model of personality. *Personality and Individual Differences*, *55*(3), 300-305.

Markey, P. M., & Scherer, K. (2009). An examination of psychoticism and motion capture controls as moderators of the effects of violent video games. *Computers in Human Behavior, 25,* 407-411.

MANUSCRIPTS IN PREPARATION/RESEARCH IN PROGRESS

Galic, Z., LeBreton, J. M., & Scherer, K. T. (under review).Validity evidence for a Croatian version of the Conditional Reasoning Test for Aggression. *International Journal of Selection and Assessment*.

LeBreton, J. M., DeSimone, J. A., Scherer, K. T., Lee, H. J., & James, L. R. (in preparation). The Impact of Subjective Decisions on Seemingly Objective Literature Reviews.

LeBreton, J. M., Scherer, K. T., Hopkins, D., Moody, M., Barksdale, C., & James, L. R. (in preparation). Measurement issues associated with the Conditional Reasoning Test for Aggression II: Test transparency, test coaching, and test faking. Working paper.

LeBreton, J. M., Scherer, K. T., Stevens, G., & Duehling, J. (in preparation). Measurement issues associated with the Conditional Reasoning Test of Aggression II: Differential item functioning due to assessment modality and gender. Working paper.

Scherer, K. T., LeBreton, J. M., & Williams, K. D. (in preparation). The implicit motive to aggress and ostracism as predictors of threatened needs in a workplace-related context.

CONFERENCE PRESENTATIONS (CHRONOLOGICALLY)

Moody, M., Hopkins, D., Scherer, K. T., & LeBreton, J. M. (2013, April). Examining the Transparency of the Conditional Reasoning Test of Aggression. Poster presented at the annual meeting of the Society for Industrial and Organizational Psychology, Houston, TX.

Scherer, K. T., & LeBreton, J. M. (2011, April). Psychopathy: Predicting counter-productive work behaviors above and beyond the global big five. In S. E. Woo & B. S. Connelly (Co-Chairs), Does specificity matter? Advantages of broad versus narrow traits. Symposium conducted at the annual meeting of the Society for Industrial and Organizational Psychology, Chicago, IL.

Osburn, H., Bedford, A., Ligon, G., Edwards, A., Scherer, K. T., Panik, L., Bruno, E., Doran, M., & DiDomenico, J. (2010, April). Human Resource Management Interventions for Innovation: Appraising and developing performance in innovative positions. Symposium conducted at the annual meeting of the Society for Industrial and Organizational Psychology, Atlanta, GA.

Binning, J., Bradshaw, A, LeBreton, J. M., & Scherer, K. T. (2010, April). Understanding Turnover Propensity via Job-specific and Identity-based Emotional Beliefs. Symposium conducted at the annual meeting of the Society for Industrial and Organizational Psychology, Atlanta, GA.

Bennett, C. R., Shadowen, N., Scherer, K. T., Markey, P. M., & Markey, C. N. (2009, May). Geometric models and violent video games: A new application of "interpersonal statistics." Paper presented at the annual conference for the Society of Interpersonal Theory and Research, Toronto, Canada.

RELEVANT GRADUATE COURSEWORK

- Statistical approach to social psychology
- Applied regression
- Multivariate analysis in organizational research
- Multilevel theory, measurement, and analysis
- Introduction to classical and modern test theory
- Structural equation modeling
- Research methods
- Survey of industrial psychology
- Survey of organizational psychology
- Work motivation
- The assessment center method
- Work attitudes and affect
- Leadership

APPLIED EXPERIENCE

- **Denver Public Schools** and **City of Fort Collins**. Virtual training simulations, reporting, and coaching. February 2014-present.
- **Emirates Group**. Conducted audit of selection system. Spring/Summer 2012.
- **United Nations**. Conducted large-scale audits of managerial assessment and development center programs. September 2011-February 2012.
- **West Lafayette Police Department**. Constructed and updated promotion exams for ranks of Sergeant, Lieutenant, and Captain. January 2012 – present.

MENTORING EXPERIENCE

Primary Lab Coordinator for Personality Research Laboratory (July 2011 to present)
* Denotes undergraduates who have enrolled or plan to enroll in graduate programs

Undergraduate Honors Students

2011 Devon Hopkins*
2012 Megan Moody*

Undergraduate Student Researchers

2011	Camille Buscomb Jennifer Oldham* Josh Stephenson Ellen Sunden* Rose Trotto* Daniel Van De Voorde Ashley Westen	2012	Jennifer Oldham Mansi Parikh Stephanie Phoa Taylor Rathke* Josh Stephenson Ellen Sunden* Rose Trotto* Amanda Frankenwich

PROFESSIONAL MEMBERSHIPS

Society for Industrial and Organizational Psychology

REFERENCES

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