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Previous research has produced inconsistent findings in terms of how self-esteem relates to aggressive behavior. Some studies have found that high self-esteem predicts aggression while others have found that low self-esteem predicts aggression. The present study sought to clarify the discrepancies in the literature. It was hypothesized that the interaction between an ego threat and fragile high self-esteem would account for significant variance in aggressive behavior over-and-above the component main effect. Additionally, it was hypothesized that the interaction of high explicit and low implicit self-esteem would account for significant variance in narcissistic traits over-and-above the component main effects. Finally, it was hypothesized that the interaction between an ego threat and narcissistic traits would account for significant variance in aggressive behavior over-and-above the component main effect. One hundred eighteen undergraduate participants completed questionnaires and the other aspects of the study that assessed self-esteem, narcissistic traits, and aggression. Results failed to support the hypotheses regarding the interactions between an ego-threat, fragile high self-esteem, and narcissistic traits. However, consistent with previous research, main effects results indicated that participants with high levels of explicit self-esteem were more aggressive and reported more narcissistic traits than participants with low explicit self-esteem. The results are discussed in terms of their implications for future research.

YOU HURT ME, I'LL HURT YOU: THE PREDICTION OF AGGRESSION BASED
ON THE INTERACTION BETWEEN AN EGO THREAT, FRAGILE HIGH
SELF-ESTEEM, AND NARCISSISTIC TRAITS

by

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CHAPTER I

INTRODUCTION

Aggressive behavior has been a focus of research for decades for a number of reasons. First, aggressive behavior is a pervasive problem. According to the National Crime Victimization Survey (2008), 19.3 per 1,000 persons age 12 or older were victims of a violent crime. It was reported that simple assault is the most frequently occurring violent crime and affects about 13.9 per 1,000 persons age 12 or older, resulting in more than 3.4 million victims of simple assault. Additionally, aggressive behavior has profound implications for both the person and society. The person perpetuating these aggressive acts is subject to legal fees, is likely to be sent to prison, and is at an increased risk for recidivism. In addition to the negative consequences for the perpetrator, society is affected by these violent crimes as well. Victims of these crimes endure significant injury and distress. There is also a large financial burden to society due to the costs associated with prosecuting and maintaining the prisons that house these offenders.

Given these problems, a tremendous amount of research has focused on understanding what factors are related to aggressive behavior. There are a number of factors that are thought to influence whether someone will be aggressive, including affiliation with deviant peer groups, impulsivity, and personality variables. One area that has also been of interest is how self-esteem influences whether someone will display

aggressive behavior. Research has shown that a person's self-esteem can have an impact on whether he or she will display aggressive behavior. However, research examining the way in which self-esteem influences aggression has produced inconsistent findings (Ostrowsky, 2009).

The goal of the present study, therefore, was to further explore the association between self-esteem and aggressive behavior. While self-esteem is a broad term, for the purposes of the present study it is conceptualized as a trait like variable that involves a person's overall evaluation or appraisal of his or her own worth as measured by the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) and the self-esteem Implicit Association Test (IAT; Greenwald & Farnham, 2000). In addition, aggressive behavior can encompass a number of behaviors including verbal and physical actions. However, for the purposes of the present study, aggressive behavior is conceptualized as a hostile response to a perceived threat as measured by the volume participants set beeps at in order to deliver them to another participant. Given the mixed findings regarding the relation between self-esteem and aggression, this thesis first explores research on the relation between aggression and high self-esteem, followed by a discussion on the relation between the theory of threatened egotism, narcissism, and self-esteem and the rationale for exploring the relation of these constructs for the purposes of the present study.

Self-esteem and Aggression

One belief that was held for many years is that high levels of aggression are related to low self-esteem. One theory about why this might be is that people who have low self-esteem try to improve their self-esteem through violence. This method of improving one's self-esteem is referred to as self-enhancement (Papps & O'Carroll, 1998). A number of studies during the 1980s and 1990s indicated that there is an association between low self-esteem and violence (Janowski, 1991; Oates & Forrest, 1985; Toch, 1993). However, within these and other studies, this association was implied rather than being definitively argued and was not directly examined. By the late 1990s, limited empirical support for this theory had been found. As a reaction to this lack of support, another theory regarding the association between self-esteem and aggression emerged.

Baumeister, Smart, and Boden (1996) proposed that aggressive behavior does not result from low self-esteem; rather it is the result of high self-esteem. This theory does not simply posit that high self-esteem is responsible for violent behavior. Instead, Baumeister et al. propose that violent behavior is the result of a combination of high self-esteem and a threat to that self-esteem, referred to as an ego threat. Egotism refers to a highly favorable self-evaluation and a motivation to maintain this favorable view of oneself. Threatened egotism refers to a favorable self-evaluation that encounters an external, unfavorable evaluation (Baumeister et al., 1996). The theory of threatened

egotism holds that when a person with a highly favorable self-esteem is questioned, mocked, or challenged in some way, he or she may react aggressively against the source of the threat. They may do this for one of two reasons. They may display aggressive behavior as a way to thwart threats to their perception of themselves or as an attempt to force someone into respecting them.

Van Boxtel, Orobio de Castro, and Goossens (2004) directly tested Threatened Egotism theory along with two other competing theories. The first hypothesis tested the traditional theory that aggressive behavior is the result of low self-esteem. The second hypothesis tested whether aggressive behavior is the result of high self-esteem in the absence of a threat. The third hypothesis tested Baumeister's theory that aggressive behavior is the result of high self-esteem paired with peer rejection. Van Boxtel et al. found support for Baumeister's theory. They found that the interaction between an overly high self-esteem combined with a threat to the self-esteem (i.e., peer rejection) explained more of the variance in aggressive behavior than high self-esteem alone.

Threatened Egotism and Narcissism

Although there is research that has supported the hypothesis that the interaction between an ego threat and high self-esteem predicts aggression, it has been suggested that a more complicated association exists. Bushman and Baumeister (1998) proposed that it is a particular subset of people with high self-esteem who are likely to react aggressively to an ego-threat. It was proposed that people who had narcissistic traits, defined as

arrogance, conceitedness, and domineering attitudes and behaviors, are particularly likely to react aggressively to an ego-threat. There has been a substantial amount of research that has examined how narcissistic traits predict aggression in an ego-threat paradigm.

Narcissism has been a central construct in threatened egotism research due to its relation to exaggerated high self-esteem. Freud was the first to describe the construct of narcissism. He labeled this excessive self-admiration narcissism after the Greek character Narcissus, who fell in love with his reflection he saw in water. Although narcissism has its roots in psychodynamics, it has remained a part of current psychology. Narcissistic Personality Disorder (NPD) has been a diagnostic category in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) since the third edition which was published in 1980 (DSM-III; 1980). NPD remained a diagnostic category in the present edition of the DSM (DSM-IV-TR, 2000). According to the DSM-IV-TR (2000), the primary characteristics of narcissism are a pervasive pattern of grandiosity, need for admiration, being preoccupied with issues of personal adequacy and power, interpersonal exploitation, and lacking empathy. While narcissism and high self-esteem are considered related constructs, they are not thought to be synonymous. For example, individuals with high levels of narcissistic traits often have affect and self-esteem dysregulation as well as difficulties in interpersonal relationships that are not commonly observed in individuals with high self-esteem (Pincus & Lukowitsky, 2010). Other researchers have found that

while people high in narcissistic traits do report higher self-esteem, many individuals with high self-esteem do not have the presence of narcissistic traits (Maples, Miller, Wilson, Seibert, Few, & Zeichner, 2010).

Bushman and Baumeister (1998) were the first to examine how threatened egotism was influenced by narcissistic traits. The authors posited that narcissistic traits could play a role in the association between an ego-threat and aggression, given that individuals with narcissistic traits are particularly vulnerable to negative feedback. The authors predicted that the highest levels of aggression would be seen among individuals subjected to an ego-threat who also scored high on the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979). The authors used the following, now classic, ego-threat design to test this hypothesis. The authors had participants complete an essay which was then “evaluated” by another participant and were given either positive or negative feedback; this negative feedback served as the ego-threat. Next, the participants completed a competitive reaction time task in which they were told they would be able to deliver a blast of noise to the other participant if they won; this noise served as the measure of aggression. The authors’ findings supported their hypothesis. They found the highest level of aggression among individuals with the combination of an ego-threat and high scores on the NPI. Since this first study, these findings have been replicated by a number of other researchers (Bushman, Baumeister, Thomaes, Ryu, Begeer, & West, 2009; Konrath, Bushman, & Campbell, 2006; Thomaes, Bushman, Stegge, & Olthof,

2008; Twenge & Campbell, 2003).

Although there is a substantial amount of research that supports the relation of narcissistic traits and threatened egotism, there has been growing disagreement regarding the appropriateness of using the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979) in these studies and in other areas of psychological science. One reason for this is discontent over the use of the NPI is that research has found that the NPI has an unstable factor structure (Raskin & Terry, 1988). As a result, the NPI total score is the only score seen as acceptable for use in psychological research. Additionally, research suggests that the NPI assesses “normal” narcissism and is frequently found to have positive associations with measures of adaptive functioning (Campbell, Bosson, Goheen, Lakey, Lerner, 2007; Zeigler-Hall, 2006). A normal expression of narcissistic traits is conceptualized as one’s ability to maintain a positive self-image through a variety of healthy self-regulatory processes (Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009). Another criticism of the NPI is that the scores are normally distributed. It has been argued that if the NPI were really measuring narcissism, as conceptualized in the DSM-IV-TR, the distribution would be skewed, and not normally distributed (Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009).

Another criticism of the research in this area is that narcissism, as conceptualized in the DSM-IV and as measured by the NPI, focuses exclusively on the grandiosity associated with narcissism and neglects the vulnerability that can be characteristic of

individuals with narcissistic traits (Cain, Pincus, & Ansell, 2008). In an attempt to address these problems, a study was published on the initial construction and validation of the Pathological Narcissism Inventory (PNI; Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009). It is proposed by the authors that the PNI assesses two broad classifications of narcissism: Grandiose narcissism and vulnerable narcissism, which they suggest presents a more complete picture of narcissistic traits. Grandiose narcissism is conceptualized as arrogant, conceited, and domineering attitudes and behaviors while vulnerable narcissism is conceptualized as the conscious experience of helplessness, emptiness, low self-esteem, and shame (Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009). It should be noted that, although the authors proposed this high-order factor structure, it has not been subjected to confirmatory factor analysis. For the purposes of the present paper, narcissism is conceptualized as a multidimensional construct consisting of traits of both narcissistic grandiosity and narcissistic vulnerability as measured by the Pathological Narcissism Inventory (PNI; Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009).

The PNI is a 52-item self-report measure assessing seven dimensions of pathological narcissism: *Entitlement Rage, Exploitativeness, Grandiose Fantasy, and Self-sacrificing self-enhancement, Contingent Self-esteem, Hiding the Self, and Devaluing*. It is encouraging that researchers have developed a measure that might be a more appropriate measure of the multi-dimensional conceptualization of narcissistic traits

(i.e., both grandiose and vulnerable traits). Given that this is a new measure of narcissistic traits, the research regarding the association between threatened egotism and narcissistic traits that has already been established in the literature needs to be explored using this measure. Using a measure that assesses for the broad spectrum of narcissistic traits within the threatened egotism literature will allow researchers to gain a better understanding of the relation between these constructs.

Current Research on Low Self-esteem and Aggression

Despite the large body of literature supporting the threatened egotism theory, in recent years there has been resurgence in interest regarding the association between low self-esteem and aggression. Unlike the previous research on this topic, current research specifically set out to examine the association between low self-esteem and aggression. The research that has been conducted recently has found some support for the hypothesis that low self-esteem is predictive of aggression. Donnellan, Trzesniewski, Robins, Moffitt, and Caspi (2005) used a cross-sectional design to explore the relation between self-esteem and externalizing problems (i.e., aggression and antisocial behavior). They found that low self-esteem was related to aggression. As a follow up to this study, these researchers then explored the long-term consequences of self-esteem within the longitudinal data from the Dunedin Multidisciplinary Health and Development Study (Trzesniewski, Donnellan, Moffitt, Robins, Poulton, & Caspi, 2006). The authors found that adolescents with low self-esteem were significantly more likely to have been arrested

and convicted of a violent crime than were adolescents with high self-esteem.

Sutherland and Shepherd (2002) conducted a survey in the United Kingdom on 13,650 adolescents who were administered the Adolescent Substance Abuse Questionnaire. From this questionnaire, the authors used data concerning self-esteem and violence (e.g., fighting) to examine whether there was an association between self-esteem and violence. The authors found that low self-esteem was a strong predictor of violence. Given that recent research has found support for the hypothesis that low self-esteem is predictive of aggression, this has led to a debate regarding whether it is really low or high self-esteem that is related to aggression.

There have been a number of possible explanations provided for the inconsistent findings regarding self-esteem and aggression. It has been suggested that the inconsistencies in the literature may be due to the types of violence being measured. It has further been suggested that these inconsistent findings may be the result of problems with the current measures self-esteem (Ostrowsky, 2010). The majority of the research that has been conducted on the topic of self-esteem and aggression has used global measures of self-esteem such as the Rosenberg Self-Esteem Scale to assess self-esteem. Some researchers suggest that self-esteem should be treated as a multi-dimensional construct rather than a global construct and that high self-esteem should be seen as falling along a continuum from secure high self-esteem to fragile high self-esteem (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003). Secure high self-esteem is

conceptualized as positive attitudes toward the self that are realistic, well-anchored, and resistant to threat, while fragile high self-esteem is conceptualized as feelings of self-worth that are vulnerable to challenge, need constant validation, and frequently require some degree of self-deception (Zeigler-Hill, 2006). It has been suggested that in order to clarify the issue regarding self-esteem and aggression, research needs to consider the full range of high self-esteem.

Secure and Fragile High Self-esteem

There has been some research that has examined the idea that self-esteem falls along a continuum between secure and fragile self-esteem. People could therefore have either high or low secure self-esteem or high or low fragile self-esteem. While these different self-esteem styles are possible, this study focuses on secure and fragile high self-esteem given the hypothesized relation to narcissistic traits. In the literature, secure high self-esteem and fragile high self-esteem have been measured in a number of different ways. One method involves examining the discrepancy between implicit and explicit self-esteem. Implicit self-esteem refers to nonconscious, automatic, and overlearned self-evaluations while explicit self-esteem refers to global self-evaluations that one is conscious of and can therefore report on (Zeigler-Hill, 2006). Explicit self-esteem is measured using a variety of self-report measures, most commonly the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). Implicit self-esteem is typically measured using the Implicit Association Test (IAT; Greenwald & Farnham, 2000). Using

the method of discrepant implicit and explicit self-esteem, a person with high explicit and high implicit self-esteem is conceptualized as having secure high self-esteem. Conversely, a person with high explicit and low implicit self-esteem is conceptualized as having fragile high self-esteem. Another area of interest is whether this approach is measuring self-esteem instability due to narcissistic traits or whether instability in self-esteem is common in people. While this is an important area of future research, it is beyond the scope of this paper. Therefore, for the purposes of the present study, secure high self-esteem and fragile high self-esteem will be operationalized as a person with high explicit and high implicit self-esteem and a person with high explicit and low implicit self-esteem, respectively.

The concept of secure and fragile high self-esteem has implications for research on aggression as well as research on narcissistic traits. There are a few studies that have explored the relation between secure and fragile high self-esteem and narcissistic traits. Jordan, Spencer, Zanna, Hoshino-Browne, and Correll (2003) conducted one of the first studies to examine this relation. The authors had participants complete the Narcissistic Personality Inventory, the Rosenberg Self-Esteem Scale as the measure of explicit self-esteem, and the Implicit Association Test as the measure of implicit self-esteem. They found that those individuals with high explicit self-esteem and low implicit self-esteem had the highest levels of narcissistic traits. Two other studies have replicated and extended these findings by exploring how other measures of implicit self-esteem

influence this association (Campbell, Bosson, Goheen, Lakey, & Kernis, 2007; Zeigler-Hill, 2006). In addition to supporting the previous findings, these studies found that the Implicit Association Test appears to be the best measure to test this association. Although this research is still new, this association fits with the notion that a key characteristic of narcissistic individuals is that they are portraying high self-esteem to the world, but in actuality have low self-esteem that they may be covering for, either consciously or unconsciously.

As stated previously, the idea of fragile high self-esteem has implications for research on narcissistic traits and aggression. While there is a growing body of literature supporting the association between narcissistic traits and fragile self-esteem, much less is known about its relation with aggression. Only one study that the author could find looked at the relation between fragile high self-esteem and aggression (Sandstrom & Jordan, 2008). This study was interested in whether children with fragile high self-esteem would display more aggressive behavior as reported by a teacher than children with secure high self-esteem. The authors' findings supported their hypothesis in that children with fragile high self-esteem showed the highest levels of aggression. While this study is informative, it is limited in that it was conducted with children and it employed a correlational design. Expanding upon this study with other populations would be useful, as would employing an experimental design to test this association.

Limitations of Previous Research

Many studies that have examined the relation between self-esteem and aggression have been limited by considering either low or high self-esteem. Almost no studies have examined how explicit and implicit self-esteem interact to predict aggressive behavior. Those studies that have examined how explicit and implicit self-esteem interact to predict aggressive behavior have used correlational designs. Limiting these studies to the use of correlational designs does not allow for a complete understanding of how the interaction of explicit and implicit self-esteem predicts aggression. Therefore, researchers need to test this interaction using an ego threat paradigm. Another limitation of the previous research on the theory of threatened egotism is that the majority of studies have used the NPI as the measure of narcissistic traits. This has limited the research for all the reasons outlined above. Given this, researchers need to test the theory of threatened egotism using the PNI as the measure of narcissistic traits. Finally, few studies have considered how low and high explicit and implicit self-esteem interact to predict narcissistic traits. Given that it is a common assumption that narcissism is characterized by fragility in self-esteem, research should continue to explore the relation between low and high explicit and implicit self-esteem and narcissistic traits to clarify this relation.

Purpose of the Present Study

The purpose of the present study was to extend the extant literature by addressing the limitations outlined above. Specifically, almost no studies have examined how

explicit and implicit self-esteem interact to predict aggressive behavior. The few studies that have examined how the interaction of explicit and implicit self-esteem is related to aggression have used a correlational design. Given this limitation, an experimental design using an ego-threat to elicit aggressive behavior was employed in the present study. Additionally, as few studies have examined how low and high explicit and low and high implicit self-esteem interact to predict narcissistic traits, this interaction was explored. Finally, as the majority of threatened egotism studies have used the NPI as the measure of narcissistic traits, the present study sought to examine the relation between scores on the PNI and aggressive behavior using an ego-threat paradigm. However, given that this was the first study to examine the relation between narcissistic traits, threatened egotism, and aggression using the PNI, the present study also used the NPI for comparison.

Three specific research objectives were addressed in the present study: (1) whether individuals with fragile high self-esteem, operationalized as high explicit and low implicit self-esteem, will display more aggressive behavior when subjected to an ego-threat; (2) whether high explicit self-esteem and low implicit self-esteem (that is, fragile high self-esteem) predicts narcissistic traits; (3) whether narcissistic traits, as measured using the PNI, will predict aggressive behavior when a person is subjected to an ego threat differently than narcissistic traits, as measured using the NPI.

Hypotheses

The following hypotheses were proposed regarding the association between narcissistic

traits, explicit and implicit self-esteem, ego-threat, and aggressive behavior:

- 1.) The interaction between an ego-threat and fragile high self-esteem will account for significant variance in aggressive behavior over-and-above the component main effects.
- 2.) The interaction of high explicit and low implicit self-esteem will account for significant variance in narcissistic traits over-and-above the component main effects. This was tested with both the PNI and the NPI. It was hypothesized that the PNI would be a stronger predictor of the combination of high explicit and low implicit self-esteem.
- 3.) The interaction between an ego-threat and narcissistic traits will account for significant variance in aggressive behavior over-and-above the component main effects. This hypothesis applied to narcissistic traits as measured by both the PNI and the NPI. It was hypothesized that the PNI would be a stronger predictor of aggression.

CHAPTER II

METHOD

Participants

Male and female undergraduate students ($n = 118$) were recruited from the University of North Carolina at Greensboro introductory psychology subject pool to participate in the study. Participants who scored higher, more than one standard deviation above the mean, on the Pathological Narcissism Inventory in mass-screening sessions were oversampled. These participants were sent an email inviting them to participate in the study. 148 participants received the recruitment email. 69 participants responded to email and signed up for the study. The remaining participants participated if they signed up for the study through Experimentrix, regardless of their scores on the narcissism measure. 49 participants enrolled for the study that did not score more than one standard deviation above the mean on the Pathological Narcissism Inventory in mass-screening sessions. Data collected from 10 of these participants were excluded from analyses due to the participants providing excessive missing data (defined as failing to complete 5% or more of the items on any one questionnaire). Therefore, the final sample consisted of 108 undergraduate participants. Participants included 72 females (66%) and 36 males (34%), which is consistent with the demographic composition of psychology undergraduates.

Materials

Pathological Narcissism Inventory. The Pathological Narcissism Inventory (PNI) is a 52-item self-report measure assessing seven dimensions of pathological narcissism (found in Appendix A). The PNI consists of seven subscales: *Entitlement Rage*, *Exploitativeness*, *Grandiose Fantasy*, and *Self-sacrificing self-enhancement*, *Contingent Self-esteem*, *Hiding the Self*, and *Devaluing*. The number of items per scale range from 5 to 12, and participants responded to each of the 52 items on a 6-point Likert scale ranging from 0 (not at all like me) to 5 (very much like me). The PNI scales have demonstrated good to excellent internal consistency. A study conducted with a sample of undergraduates yielded alpha coefficients ranging from .75 to .95 (Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009). The PNI was used as the measure of narcissism that participants completed as part of a packet of questionnaires given in mass-screening sessions. Participants with scores at least one standard deviation above the mean of the sample on the PNI were oversampled for the study.

Narcissistic Personality Inventory. The Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979) is a 40-item forced-choice measure of trait narcissism (found in Appendix B). This measure is limited for all the reasons outlined above. However, given that the present study was the first to use the PNI in the ego-threat paradigm, the NPI was administered in order to examine the different ways in which these measures predict aggression and correlate within the sample.

Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was administered to assess explicit self-esteem. The RSES is a 10-item self-report measure of global self-esteem that is rated on a four point Likert scale ranging from 1 (strongly agree) to 4 (strongly disagree) (found in Appendix C). The RSES has been shown to have test-retest correlations greater than .80 (Rosenberg, 1965). Additionally, the RSES has demonstrated good internal consistency for various samples. For example, a study conducted with a sample of undergraduates in psychology yielded an alpha coefficient of .82 (Zeigler-Hill, 2006). This measure was administered using the Inquisit 3 (Version 3.0.4.0) psychological measurement software.

Positive and Negative Affect Schedule. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item self-report measure of positive and negative affect. There are 10 items measuring positive affect and 10 items measuring negative affect (found in Appendix D). Participants are asked to rate on a 6-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely) how they are currently feeling in regards to each of the 20 words. The PANAS has been shown to have test-retest correlations ranging from .79 to .81. The PANAS has demonstrated good internal consistency with alpha coefficients ranging from .85 to .91. Finally, the two scales measuring positive and negative affect have been shown to be largely uncorrelated (Watson, Clark, & Tellegen, 1988). The PANAS was administered as a pre and post-measure to determine if the ego-threat had an effect on the participant's mood. A manipulation check was conducted using a regression analysis. The type of feedback

participants received did not significantly predict a change in the negative or positive affect, as measured using the sum of scores for these scales. However, at an item level results showed a significant increase in participants' ratings on item 11 of the PANAS (i.e., irritability) when they received negative feedback on their essay ($\beta = .184, p < .05$).

Implicit Association Test. The self-esteem Implicit Association Test (IAT; Greenwald & Farnham, 2000) was administered to assess implicit self-esteem. The IAT is a task performed on the computer that is designed to assess automatic associations between stimuli. Associations between the stimuli are presumed to be stronger the faster the participants are able to assign words (e.g., murder, peace) to different target categories (e.g., good, bad). The IAT for measuring implicit self esteem uses pronouns to represent "self" versus "other" target categories (e.g., me, them) and positive and negative trait words (e.g., smart, ugly). This measure was administered using the Inquisit 3 (Version 3.0.4.0) psychological measurement software.

Continuous Performance Test. The Continuous Performance Test (CPT; Rosvold, Mirsky, Sarason, Bransome, Jr., Beck, 1956) is typically used to measure continuous and discriminating attention and impulsivity. However, for the present study, the CPT was used to disguise the measure of aggression. No data from the CPT were used in the present study. For the CPT, participants are shown a series of letters. Participants must respond whenever an "X" is displayed. This measure was used for the "competitive reaction time task" portion of the present study. Participants completed 5 blocks of the

responding to "X" task. This took participants approximately 3-5 minutes to complete. This measure was administered using the Inquisit 3 (Version 3.0.4.0) psychological measurement software.

Aggression. Aggression was measured as the volume at which the participants set the beeps at (1-10) that they could deliver to another participant if they won the “competitive reaction time task.”

Procedures

Some participants were invited to participate in the study based on their scores on Pathological Narcissism Inventory that they completed as part of a packet of questionnaires given in mass-screening sessions. Other participants were allowed to participate if they signed up for the study through a website called Experimentrix. The study had sessions consisting of 2-3 participants. The sessions had a limited number of participants given the experimental nature of the study.

When the participants arrived to the study, they were told that there were other participants who arrived early and already started. This was done in an effort to deceive the participants into believing that there were between 4-6 participants during each session. Next, the participants were asked to read and sign consent forms (located in Appendix E). The consent forms provided a description of the study. This description explained that the experimenter was interested in how personality influences a variety of

factors such as self-esteem, performance in school, and reaction time when competing against another person. This explanation was given to provide a rationale for the components of the study to follow. This was done in an attempt to limit participant's ability to guess what the study was really about. Participants then received a questionnaire packet containing the PNI, NPI, and PANAS with instructions for completing them. After completing the questionnaires, participants then completed the RSES and the IAT on the computer.

After the questionnaire portion of the study, participants were then asked to write a short essay (1-2 paragraphs) either supporting the pro-life or pro-choice position. The experimenter explained that they were going to have another participant review the essay and give them some feedback. The participant was instructed that they would also be reviewing the other participant's essay. The participant was asked what position they will be writing about so that the experimenter could make sure to have their essay reviewed by someone who took the same position as the participant so as to eliminate any bias. After participants completed the essay, the experimenter returned to the room and collected their essay. Next, the experimenter left the room and then returned with an essay for the participant to review. After the participant was given time to review the essay, the experimenter returned with the participant's essay. The essays had one of two comments on it, "Good essay. No other comments" or "You really need to go to the writing center!" After the participants received their feedback, they were asked to

complete the PANAS a second time.

Next, the experimenter asked the participant to complete the reaction time task. The experimenter explained that this was a competitive reaction time task and that they would be competing against the participant who evaluated their essay given that they are ready for that portion of the study as well. They were told that if they won the round they could choose to give the other participant a loud beep through the earphones they each were wearing. The participant was instructed that they could pre-determine the level of the volume they would like to set the beep at (1-10). They were instructed that if they lose, the other participant would be able to give them the loud beep. The participants listened to two beeps, one at a level 1 and one at a level 5 in order to give the participant an idea of the volume and to make them think that they would really be delivering a beep to the other participant. The participants were instructed to select the volume of the beep at this point. Next, the participants completed 5 blocks of the reaction time task. The computer was programmed so that the participant won the reaction time task. A message appeared on the screen stating that they won the task and that they could choose the number of times, between 1 and 5, they would like to deliver a beep to the other participant. After participants completed the study, they were debriefed regarding the true purpose of the study (located in Appendix F). All participants received course credit for their time.

CHAPTER III

RESULTS

Preliminary Analyses

Descriptive statistics for all scales are reported in Table 1 (all tables are located in Appendix G). Cronbach's alpha was calculated in order to examine the internal consistency of each scale, which ranged from a low of .706 (low but acceptable range) for ISE, to a high of .949 (good range) for PNI. The normality of the data was also assessed and, consistent with the guidelines provided by Kline (2005), it was found that the scores for all scales were normally distributed (e.g., the skewness and kurtosis statistics were $< \pm 1$ for all scales). This finding was interesting given the question regarding whether researchers would expect measures of narcissistic traits to be normally distributed. While the authors of the PNI criticized the NPI for being normally distributed, it should be noted that in addition to the NPI, the PNI was normally distributed as well.

Pearson Correlations

Pearson correlations between each of the study variables are reported in Table 2. The PNI total score was negatively correlated with the Rosenberg Self-Esteem Scale (RSES) ($r = -.453, p < .05$). The PNI subscales that were significantly negatively

correlated with the RSES were Contingent Self-esteem, Hiding the Self, Devaluing, and Entitlement Rage ($r = -.625, p < .01$; $r = -.362, p < .01$; $r = -.464, p < .01$, and $r = -.222, p < .01$, respectively). There was not a significant correlation between the PNI and the IAT or aggression. The Narcissistic Personality Inventory (NPI) was positively correlated with the RSES ($r = .33, p < .01$) and aggression ($r = .199, p < .05$). The NPI was also significantly positively correlated with a number of the PNI subscales including Entitlement Rage, Exploitativeness, and Grandiose Fantasy ($r = .311, p < .01$; $r = .526, p < .01$; and $r = .262, p < .01$, respectively). The IAT was not correlated with the RSES. The researchers who developed the self-esteem IAT explained that it is expected that there would be no correlation between the RSES and the IAT given that these are thought to be two distinct constructs, measuring different types of self-esteem (Greenwald & Farnham, 2000).

Given the substantial degree of intercorrelation among the variables, Pearson correlations alone make it difficult to examine the unique contributions of any one variable. In order to more fully examine and confirm the hypotheses, multiple regression analyses were conducted.

Multiple Regression Analyses

Multiple Regression One. The first regression analysis was conducted to test the first hypothesis that the interaction between an ego-threat and fragile high self-esteem (high explicit and low implicit self-esteem) will account for significant variance in

aggressive behavior over-and-above the component main effects. Feedback was dummy coded with one representing negative feedback and zero representing positive feedback. Additionally, self-esteem variables were mean-centered for this analysis, as recommended by Cohen, Cohen, West, and Aiken (2002). The main effects of explicit self-esteem and implicit self-esteem were entered in the first step of the regression and feedback was entered at the second step. In the third step of the regression, the interaction between ego explicit self-esteem and implicit self-esteem was entered. In the fourth step of the regression, the interactions between ego-threat and explicit self-esteem and ego-threat and implicit self-esteem were entered. In the fifth step of the regression, the interaction between ego-threat, explicit self-esteem, and implicit self-esteem was entered.

The result of the first multiple regression analysis can be seen in Table 4. The first step in the regression accounted for 4% of the total variance in aggression scores ($R^2 = .046$) ($f^2 = .048$). With regard to self-esteem variables main effects, the Rosenberg self-esteem scale was found to uniquely predict aggression scores ($\beta = .216, p < .05$). With regard to an ego-threat main effect, type of feedback was not uniquely associated with aggression scores. When the two-way interaction terms were entered in the third and fourth steps, the interaction terms were not significant and only accounted for an additional 2% of the total variance in aggression scores. When the three-way interaction term was entered in the fifth step, the interaction term was not significant and only accounted for an additional 1% of the total variance in aggression scores. The total model

accounted for approximately 7% of the total variance in aggression scores ($R^2 = .075$) ($f^2 = .081$). This analysis was run controlling for sex. Controlling for sex did not change the results.

Multiple Regression Two. The second regression analysis was conducted to test the second hypothesis that the interaction of high explicit and low implicit self-esteem will account for significant variance in narcissistic traits over-and-above the component main effects. This was tested with both the PNI and the NPI. It was hypothesized that the PNI would be a stronger predictor of the combination of high explicit and low implicit self-esteem. Self-esteem variables were mean-centered for this analysis, as recommended by Cohen, Cohen, West, and Aiken (2002). The main effects of explicit self-esteem and implicit self-esteem were entered in the first step of the regression. In the second step, the interaction between explicit self-esteem and implicit self-esteem was entered.

The result of the second multiple regression analysis with PNI as the outcome measure can be seen in Table 5. The first step in the regression accounted for approximately 22% of the total variance in narcissistic traits ($R^2 = .218$) ($f^2 = .279$). With regard to self-esteem variables main effects, the Rosenberg self-esteem scale was found to be uniquely associated with narcissistic traits ($\beta = -.443, p < .001$). When the interaction term was entered in the second step, the interaction term was not significant and did not account for any additional variance in narcissistic traits. The total model

accounted for approximately 22% of the total variance in narcissism scores ($R^2 = .218$) ($f^2 = .279$). This analysis was run controlling for sex. Controlling for sex did not change the results.

The result of the second multiple regression analysis with NPI as the outcome measure can be seen in Table 6. The first step in the regression accounted for approximately 12% of the total variance in narcissistic traits ($R^2 = .124$) ($f^2 = .14$). With regard to self-esteem variables main effects, the Rosenberg self-esteem scale was found to be uniquely associated with narcissistic traits ($\beta = .352, p < .001$). When the interaction term was entered in the second step, the interaction term with NPI as the outcome measure was not significant and only accounted for an additional 3% of the variance in narcissistic traits. The total model accounted for approximately 15% of the total variance in narcissism scores ($R^2 = .154$) ($f^2 = .182$). This analysis was run controlling for sex. Controlling for sex did not change the results.

Multiple Regression Three. The third regression analysis was conducted to test the third hypothesis that the interaction between an ego-threat and narcissistic traits will account for significant variance in aggressive behavior over-and-above the component main effects. This applied to narcissistic traits as measured by both the PNI and the NPI. It was hypothesized that the PNI would be a stronger predictor of aggression. Feedback was dummy coded with one representing negative feedback and zero representing positive feedback. Additionally, narcissism variables were mean-centered for this

analysis, as recommended by Cohen, Cohen, West, and Aiken (2002). The main effect of narcissistic traits was entered in the first step of the regression. The main effect of narcissistic traits was entered in the second step of the regression. In the third step, the interaction between ego-threat and narcissistic traits was entered.

The result of the third multiple regression analysis with the NPI as the independent variable can be seen in Table 7. The first step in the regression accounted for approximately 4% of the total variance in aggression scores ($R^2 = .04$) ($f^2 = .0416$). With regard to the main effects, the NPI was found to uniquely predict aggression scores ($\beta = .199, p < .05$). With regard to an ego-threat main effect, type of feedback was not uniquely associated with aggression scores. When the interaction term was entered in the third step, the interaction term was not significant. The total model accounted for approximately 7% of the total variance in aggression scores ($R^2 = .069$) ($f^2 = .074$). This analysis was run controlling for sex. Controlling for sex did not change the results.

The result of the third multiple regression analysis with the PNI as the independent variable can be seen in Table 8. The first step in the regression accounted for .3% of the total variance in aggression scores ($R^2 = .003$) ($f^2 = .003$). With regard to the main effects, neither the PNI nor the type of feedback was uniquely associated with aggression scores. When the interaction term was entered in the third step, the interaction term was not significant and only accounted for an additional .02% of the total variance

in aggression scores. The total model accounted for approximately .5% of the total variance in aggression scores ($R^2 = .005$) ($f^2 = .005$). This analysis was run controlling for sex. Controlling for sex did not change the results.

Multiple Regression Four. As a purely exploratory analysis, a fourth regression was conducted in order to determine whether explicit self esteem and implicit self-esteem would exhibit a significant interaction in the prediction of Contingent Self-esteem scores, a subscale of the PNI. The result of the fifth multiple regression analysis can be seen in Table 9. The first step in the regression accounted for approximately 4% of the total variance in Contingent Self-esteem scores ($R^2 = .401$) ($f^2 = .67$). With regard to self-esteem variables main effects, the Rosenberg self-esteem scale was found to be uniquely associated with Contingent Self-esteem scores ($\beta = -.629$, $p < .001$). However, implicit self-esteem did not predict Contingent Self-esteem scores. When the interaction term was entered in the second step, the interaction term was not significant and did not account for any additional variance in Contingent Self-esteem scores ($R^2 = .402$) ($f^2 = .67$).

Multiple Regression Five. As a purely exploratory analysis, a fifth regression was conducted in order to determine whether explicit self esteem and implicit self-esteem would exhibit a significant interaction in the prediction of Hiding the Self scores, a subscale of the PNI. The result of the sixth multiple regression analysis can be seen in Table 10. The first step in the regression accounted for approximately 16% of the total variance in Hiding the Self scores ($R^2 = .155$) ($f^2 = .183$). With regard to self-esteem

variables main effects, the Rosenberg self-esteem scale was found to be uniquely associated with Hiding the Self scores ($\beta = -.347, p < .001$). Again, implicit self-esteem did not predict Hiding the Self scores. When the interaction term was entered in the second step, the interaction term was not significant and did not account for any additional variance in Hiding the Self scores ($R^2 = .159$) ($f^2 = .19$).

Multiple Regression Six. As a purely exploratory analysis, a sixth regression was conducted in order to determine whether explicit self esteem and implicit self-esteem would exhibit a significant interaction in the prediction of Devaluing scores, a subscale of the PNI. The result of the seventh multiple regression analysis can be seen in Table 11. The first step in the regression accounted for approximately 22% of the total variance in Devaluing scores ($R^2 = .219$) ($f^2 = .28$). With regard to self-esteem variables main effects, the Rosenberg self-esteem scale was found to be uniquely associated with Devaluing scores ($\beta = -.462, p < .001$). When the interaction term was entered in the second step, the interaction term was not significant and did not account for any additional variance in Devaluing scores ($R^2 = .221$) ($f^2 = .28$).

Multiple Regression Seven. As a purely exploratory analysis, a seventh regression was conducted in order to determine whether explicit self esteem and implicit self-esteem would exhibit a significant interaction in the prediction of Entitlement Rage scores, a subscale of the PNI. The result of the eighth multiple regression analysis can be seen in Table 12. The first step in the regression accounted for approximately 7% of the total

variance in Entitlement Rage scores ($R^2 = .066$) ($f^2 = .07$). With regard to self-esteem variables main effects, the Rosenberg self-esteem scale was found to be uniquely associated with Entitlement Rage scores ($\beta = -.221, p < .05$). When the interaction term was entered in the second step, the interaction term was not significant and did not account for any additional variance in Entitlement Rage scores ($R^2 = .067$) ($f^2 = .07$).

Multiple Regression Eight. As a purely exploratory analysis, an eighth regression was conducted in order to determine whether explicit self esteem and implicit self-esteem would exhibit a significant interaction in the prediction of Vulnerable Narcissism scores, a theoretical higher order factor of PNI. The result of the ninth multiple regression analysis can be seen in Table 13. The first step in the regression accounted for approximately 37% of the total variance in Vulnerable Narcissism scores ($R^2 = .373$) ($f^2 = .59$). With regard to self-esteem variables main effects, the Rosenberg self-esteem scale was found to be uniquely associated with Vulnerable Narcissism scores ($\beta = -.599, p < .001$). When the interaction term was entered in the second step, the interaction term was not significant and did not account for any additional variance in Vulnerable Narcissism scores ($R^2 = .373$) ($f^2 = .59$).

CHAPTER IV

DISCUSSION

While self-esteem is a broad term, for the purposes of the present study it is conceptualized as a trait like variable that involves a person's overall evaluation or appraisal of his or her own worth as measured by the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) and the self-esteem Implicit Association Test (IAT; Greenwald & Farnham, 2000). In addition, aggressive behavior can encompass a number of actions. However, for the purposes of the present study, aggressive behavior is conceptualized as a hostile response to a perceived threat as measured by the volume of beeps that participants chose to deliver to another participant. The goal of the present study was to explore the association between self-esteem and aggressive behavior. Most studies that have examined self-esteem and aggression have viewed self-esteem as either low or high. Almost no studies have looked at how explicit and implicit self-esteem interact to predict aggressive behavior and the few that have examined explicit and implicit self-esteem have used a correlational design. Therefore, the present study employed an experimental design using an ego-threat to elicit aggressive behavior. Additionally, as few studies have examined how explicit and implicit self-esteem interact to predict narcissistic traits, this interaction was explored. Finally, as the majority of threatened egotism studies have used the NPI as the measure of narcissistic traits, the present study sought to examine the

relation between scores on the PNI and aggressive behavior using an ego-threat paradigm. However, given that this was the first study to examine the relation between narcissistic traits, threatened egotism, and aggression using the PNI, the present study also used the NPI for comparison.

The hypothesis regarding the interaction between an ego-threat and explicit and implicit self-esteem predicting aggression was not supported. In addition, the hypothesis regarding the interaction between explicit and implicit self-esteem predicting narcissistic traits was not supported. Finally, the hypothesis regarding the interaction between an ego-threat and narcissistic traits predicting aggression was not supported. While none of the interaction hypotheses was supported, a number of significant main effects were found that were consistent with previous research on the association between high self-esteem, aggression, and narcissistic traits.

With regards to the association between self-esteem and aggression, explicit self-esteem as measured with the Rosenberg Self-Esteem Scale significantly predicted aggression scores, regardless of whether participants received negative or positive feedback. Consistent with previous research, participants with high explicit self-esteem were significantly more likely to respond aggressively during the “competitive reaction time task” than participants with low explicit self-esteem. In terms of the association between narcissistic traits and aggression, scores on the NPI significantly predicted aggression scores. Consistent with previous research, participants with high scores on the

NPI were significantly more likely to respond aggressively during the “competitive reaction time task” than participants with lower scores on the NPI. However, contrary to previous research, scores on the PNI did not significantly predict aggression scores.

In terms of self-esteem and narcissistic traits, high explicit self-esteem as measured with the Rosenberg Self-Esteem Scale significantly predicted NPI scores. Again consistent with previous research, participants with high explicit self-esteem scored significantly higher on the NPI than participants with low explicit self-esteem. Explicit self-esteem as measured with the Rosenberg Self-Esteem Scale also significantly predicted PNI scores. Consistent with previous research, participants with low explicit self-esteem scored significantly higher on the PNI than participants with high explicit self-esteem. While at first glance the negative association between self-esteem and the PNI may appear odd, when the results of the PNI and self-esteem are examined at the subscale level, a less confusing picture emerges. The scales that appear to be driving the negative association between self-esteem and the PNI are those that fall under the vulnerable narcissism factor; Contingent self-esteem, hiding the self, devaluing, and entitlement rage. Each of these subscales was a negative predictor on the Rosenberg Self-Esteem Scale.

Upon considering the results of the present study, one should first acknowledge the limitations of the study design. Most importantly, because the data were collected at one point in time, these results can only give us information about the associations among

self-esteem and narcissistic traits. It is not possible to draw conclusions about a causal association between self-esteem and narcissistic traits. In addition, sex was controlled for in the analyses and did change the results. However, in future studies it may be important to use sex as a moderator of these variables rather than simply controlling for it in the analyses.

Finally, while using an experimental design would have allowed for a conclusion regarding the association between self-esteem, narcissistic traits, and aggression in the face of an ego-threat, this study did not find an effect for type of feedback received and aggressive responding. Therefore no causal relationship could be concluded from these data.

With those limitations in mind, several conclusions can be drawn from the findings of this study. First, in terms of the relation between self-esteem and aggression, this study found that high explicit self-esteem rather than low self-esteem was predictive of aggression. This finding contradicts the researchers who have proposed that aggressive behavior is the result of self-enhancement, the idea that people who have low self-esteem try to improve their self-esteem through violence (Papps & O'Carroll, 1998; Janowski, 1991; Oates & Forrest, 1985; Toch, 1993). Instead these findings support the research that has shown that high self-esteem is predictive of aggression (Ostrowsky, 2010). However, this study failed to replicate the strongly supported theory of threatened egotism. This study did not find that receiving negative feedback predicted whether a

participant would respond in an aggressive manner. This study also did not find that the interaction between the type of feedback that participants received and their scores on measures of self-esteem predicted aggression.

This failure to replicate this well-established association is puzzling. While, it could be due to methodological flaws of the current study, it is possible that this finding lends support to the recent view of many researchers that the relation between self-esteem and aggression is not straightforward. It has been suggested that self-esteem should be treated as a multi-dimensional construct rather than a global construct and that high self-esteem should be seen as falling along a continuum from secure high self-esteem to fragile high self-esteem (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003). While it is possible that the relation between self-esteem and aggression is more complex than has been previously thought, this study was not able to find support for the interaction between explicit and implicit self-esteem in predicting aggression. As described in the limitations section, it is possible that the failure to find an association between implicit self-esteem, explicit self-esteem, and aggression could be the result of problems with the reliability of the IAT, the measure of implicit self-esteem used in this study. This problem is discussed in terms of future directions for research regarding the association between these constructs.

This study failed to find an interaction between the type of feedback participants received and self-esteem in predicting aggression. In addition, this study failed to find an

interaction between an ego threat and narcissistic traits in predicting aggression. The failure to replicate this well-established finding is of particular concern for the current study. The lack of effect of type of feedback participants received and their aggressive response to the fictitious participant calls into question whether the experimental manipulation was successful in producing the ego threat as intended. While a manipulation check was conducted using the pre and post-PANAS scores, only one of the items showed a significant change. While the “irritable” item on the PANAS did show a significant increase when participants received negative feedback, the variance explained was very small ($R^2 = .034$). This suggests that the feedback participants received did not have the desired effect to the degree that was anticipated. There are a number of reasons why this manipulation failed to have the desired effect. First, a number of the students commented to the experimenter that they did not know what the topics of the essay, that is, “pro-choice” and “pro-life” were. Also, many of the students may not place much value in their writing abilities, and therefore may not have been upset when they received negative feedback about their essay.

In terms of self-esteem and narcissistic traits, high explicit self-esteem as measured with the Rosenberg Self-Esteem Scale significantly predicted NPI scores. Consistent with previous research, participants with high explicit self-esteem scored significantly higher on the NPI than participants with low explicit self-esteem. Explicit self-esteem as measured with the Rosenberg Self-Esteem Scale also significantly

predicted PNI scores. Consistent with previous research, and seemingly contrary to the NPI results, participants with low explicit self-esteem scored significantly higher on the PNI than participants with high explicit self-esteem. The scales that appear to be driving the negative association between self-esteem and the PNI are those that primarily fall under the vulnerable narcissism factor. Participants who scored higher on the subscales of contingent self-esteem, hiding the self, devaluing, and entitlement rage had significantly lower scores on the Rosenberg Self-esteem scale. This finding is consistent with the article by Pincus et al. (2009) that described the initial data on the newly developed PNI. Pincus et al. (2009) also found that self-esteem, as measured using the RSE, was negatively associated with contingent self-esteem, hiding the self, devaluing, and entitlement rage. The negative association between self-esteem and the subscales of vulnerable narcissism supports the idea that the PNI is a measure of pathological narcissism and thus would be associated with various areas of dysfunction, including low self-esteem. However, this study did not find a positive association between high self-esteem and the subscales of grandiose narcissism, which would be expected. These findings suggest that the PNI may be a valid measure of vulnerable narcissism, but may not be valid measure of grandiose narcissism. However, given that this was the first study to use the PNI to examine the association between an ego-threat, fragile self-esteem, narcissistic traits, and aggression, strong conclusions regarding the validity of the PNI cannot be made. These findings suggest that the usefulness of the PNI in measuring narcissistic traits needs to be explored further.

Strengths

There are several strengths of the present study. First, this study considered the interaction between high explicit and low implicit self-esteem when examining the relation between self-esteem and aggression. Many studies that have examined the relation between self-esteem and aggression have been limited by considering either low or high explicit self-esteem. Almost no studies have examined how explicit and implicit self-esteem interact to predict aggressive behavior. Another strength of the present study was that it used an experimental manipulation to examine the relation between high explicit and low implicit self-esteem and aggression. Those studies that have examined how low and high self-esteem interact to predict aggressive behavior have used correlational designs. Using an ego threat paradigm in the present study allowed for a manipulation of the type of feedback participants received and therefore allowed the study to examine how a threat to a person's sense of self interacts with low and high self-esteem to predict aggression.

Another strength of the present study is that it used both the PNI and the NPI to measure narcissistic traits. The majority of previous research on the theory of threatened egotism has used the NPI as the measure of narcissistic traits. This has limited the research for all the reasons outlined above. This study used both the NPI and the newly developed PNI to test the theory of threatened egotism. This allowed the present study to examine the relation between threatened egotism and aggression, and multiple measures

of narcissistic traits. Using both the PNI and the NPI allowed for the present study to measure a broader range of narcissistic traits, given that the NPI is thought to measure “normal narcissism” and the PNI is thought to measure “pathological narcissism.” In addition using both the PNI and the NPI in the present study allowed for a direct comparison of these measures in the context of a threatened egotism paradigm. This is a strength of this study given that this was the first study to use the PNI within the threatened egotism paradigm.

Limitations

Although this study provides useful information about the association between self-esteem, narcissistic traits, and aggression, there are several limitations that should be considered. First, fragility in self-esteem was only measured using one measure of explicit self-esteem, the Rosenberg Self-esteem Scale, and one measure of implicit self-esteem, the self-esteem Implicit Association Test. This is problematic for a number of reasons. First, problems with the reliability of the IAT have been reported. For the present study, the reliability of the IAT was the lowest of all the measures used. It is possible that the reason for the failure to find any relation between implicit self-esteem and the other measures used in this study is due to the low reliability of the measure of implicit self-esteem. A number of studies either administered the IAT multiple times, or included multiple measures of implicit self-esteem to compensate for these problems with reliability (Gregg & Sedikides, 2010).

A second limitation of the present study is the choice of the experimental manipulation. It is possible that providing students with negative feedback on an essay in which they really did not have much investment or did not understand what they were writing about failed to produce the desired effect (i.e., ego-threat). In addition, providing students with negative feedback on an essay may not have been the optimal choice given that many introductory psychology students may not place much importance on their writing abilities. If participants do not identify writing ability as something that is important to them, providing them feedback on an essay task would fail to produce an ego-threat. Perhaps choosing to provide students feedback on a task that would have more meaning for them, choosing an essay topic that students were more knowledgeable of and invested in, or controlling for GPA would have addressed the limitations of this experimental manipulation.

Implications

There are number of implications of this study. First, the results provide further support for the association between self-esteem, narcissism, and aggression. Consistent with much of the previous research on the relation between self-esteem and aggression, the present study found that high self-esteem rather than low self-esteem was predictive of aggression. In addition, this study found that narcissistic traits, as measured by the NPI, are predictive of high self-esteem and aggression, an association that has been strongly supported in the literature. The PNI, however, failed the predict aggression.

This finding suggests that the PNI needs to be further tested before it is used extensively in the literature as a measure of narcissistic traits.

This study also failed to replicate the well established relation between an ego-threat and aggression. This study did not find that receiving negative feedback predicted whether a participant would respond in an aggressive manner. This study failed to find an interaction between the type of feedback participants received, self-esteem, and narcissistic traits in predicting aggression. This finding is inconsistent with the literature in this area. However, this finding does support the thought of many researchers that the relation between self-esteem and aggression is more complex than previously has been studied. This has implications for future research in that the complex relation between self-esteem and aggression should continue to be explored.

Another implication of this study is that it calls into question the use of the Implicit Association Test as a measure of implicit self-esteem. This study found that the IAT had low reliability. After further researching this problem in the literature, it was found that other researchers have had similar problems and have also questioned the validity of the IAT as a measure of implicit self-esteem (Gregg & Sedikiedes, 2010). The problems identified with the IAT as a measure of implicit self-esteem has implications for future research in that it is clear that the validity of this measure needs to be explored further.

Future Research

Further research is needed to clarify the association between self-esteem, narcissistic traits, and aggression given the inconsistent findings in the literature. There are several ways in which future research could be improved to further our understanding of the relationships between these constructs.

First, future studies should consider using multiple measures of implicit self-esteem. Given the limitations of using the self-esteem Implicit Association Test as the only measure of self-esteem noted in the research, it would be important for future research to use multiple measures of implicit self-esteem. Another possible consideration for future research would be developing better measures of implicit self-esteem that have better reliability and would allow researchers to have more confidence in the results obtained from the measure of implicit self-esteem. Addressing the problems with the current measures of implicit self-esteem will be important because until there are better and more reliable measures of implicit self-esteem, the construct of fragile self-esteem and its relation to other variables such as narcissistic traits and aggression cannot be adequately explored.

Second, future studies should consider using multiple measures of aggression. Given that research has shown that aggression encompasses a number of behaviors and occurs in a number of contexts, it is important to use multiple methodologies for assessing aggression. In addition to using laboratory-based methods to assess aggression,

it is important that future research use measures that assess for aggressive behavior outside of the laboratory. Using multiple and diverse measures of aggression will allow researchers to gain a more complete picture of the ways in which people express aggressive behavior within all the various areas of their lives. In addition, given the well-know sex differences in aggression, future studies should also include measures of aggression that may assess the different forms of aggression seen in men and women.

Third, future research should conduct studies examining the relation between self-esteem, narcissism, and aggression using a clinical sample. Using non-clinical samples to examine the relation of these constructs limits the generalizability of the results. In addition, using a non-clinical sample often results in a truncated range of scores on the measures of narcissistic traits. Therefore, it is important for future studies to use a clinical sample in order to assess the full range of scores on these constructs which will allow for a more complete understanding of the relation between these constructs.

Finally, future research should use more meaningful experimental manipulations. There were several limitations of the present study's choice of an experimental manipulation. It appeared that a number of students did not have much investment in or did not understand what they were writing about. In addition, if students do not place much importance in their writing abilities, providing them with negative feedback on an essay task would fail to produce an ego-threat. Future studies should choose an essay topic that students were more knowledgeable of and invested in and control for GPA, in

order to account for students who do not place importance on academic achievement. In addition, future studies should use experimental manipulations that have more of an impact on participants at this age. For example, some studies have used social rejection manipulations in which confederates refuse to work with participants on the task in the study. Social relationships may be more important to participants at this age and being subjected to social rejection may be a more meaningful experimental manipulation and thus would result in the desired ego-threat.

Conclusions

The goal of the present study was to explore the association between self-esteem and aggressive behavior. Many studies that have examined the relation between self-esteem and aggression have been limited by viewing self-esteem as either low or high. Almost no studies have looked at how the low and high self-esteem interact resulting in secure or fragile self-esteem. Those studies that have examined how low and high self-esteem interact to predict aggressive behavior have used correlational designs. Therefore, the present study employed an experimental design using an ego-threat to elicit aggressive behavior. Another limitation of the previous research is that few studies have considered how explicit and implicit self-esteem interact to predict narcissistic traits; therefore, this interaction was explored. Finally, as the majority of threatened egotism studies have used the NPI as the measure of narcissistic traits, the present study sought to examine the relation between scores on the PNI and aggressive behavior using an ego-

threat paradigm.

Results did not support the hypotheses regarding the interaction of these constructs in predicting aggression or narcissistic traits. However, the main effects of these constructs were consistent with previous research. For example, results showed that high self-esteem did predict aggressive behavior and narcissistic traits. Given the inconsistent findings in the literature regarding the association between self-esteem and aggression, these findings lend support to the research showing an association between high self-esteem and aggression.

However, the limitations of this study should be considered when interpreting these results. For example, there was only one measure of implicit self-esteem to assess for fragility in self-esteem. In addition, there was only one measure of aggression (e.g. volume of beeps that were delivered). There were no questionnaires assessing aggressive behavior in other contexts that was administered. Future studies that incorporate multiple measures to assess fragility in self-esteem and multiple measures of aggressive behavior are likely to further clarify the association between self-esteem and aggression.

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APPENDIX A

CONSENT FORM SIGNED BY STUDY PARTICIPANTS

(Approved by Institutional Review Board of the university)

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

CONSENT TO ACT AS A HUMAN PARTICIPANT

(LONG FORM)

Project Title: The Influence of Personality on Self-Esteem, Academic Functioning, and Cognitive Functioning

Project Directors: Stephanie Doty B.A., & Rosemary Nelson-Gray, Ph.D.

Participant's Name: _____ (please print your name here)

DESCRIPTION AND EXPLANATION OF PURPOSE AND PROCEDURES:

This is a research project. The purpose of this study is to examine how personality influences a variety of factors such as self-esteem, academic functioning, and cognitive functioning. During this study, participants will complete a packet of questionnaires concerning their views of themselves. Next, participants will write a 1-2 paragraph essay to evaluate academic functioning. Finally, participants will compete with another participant in a computer reaction time task. All participants must be fluent in English and at least 18 years old. This study should take approximately 2 hours for you to complete. You will receive a copy of this consent form that can be kept for your records.

POTENTIAL RISKS AND DISCOMFORTS:

Completing the questionnaires and tasks for this study entails only minimal risk, as some of the items ask participant about their views of themselves that may be a sensitive subject for some people. Some participants may also feel mildly uncomfortable writing a short essay or engaging in a computer reaction time task. Any discomfort encountered, however, is anticipated to be mild (that is, no greater than would be experienced in daily life). If you feel uncomfortable answering any of the questions, you may skip them without penalty. If you experience any distress due to your participation in this study, a list of mental health referrals will be available to you upon request.

All information obtained in this study is strictly confidential unless disclosure is required by law. As an example, you will be identified by a “participant number” (not by your name or other identifying information) as a participant in this project. Questionnaires and consent forms will be kept separately in locked file cabinets within locked rooms that only members of the research team have access to. Electronic data will be stored on computers within the same locked rooms. The computers require passwords possessed only by lab members to log on. Additionally, a screensaver with a password function is automatically initiated after the computers are idle for five minutes. The master sheet with the participants’ names and identification numbers will be shredded following assignment of experimental credit. As required by IRB regulations, consent forms will be kept for three years and then shredded. Questionnaire data (without names) and electronic data (without names) will be destroyed five years after the completion of

the study.

The University of North Carolina at Greensboro Institutional Review Board, which ensures that research involving people follows federal regulations, has approved the research and this consent form. If you have any concerns about your rights, how you are being treated or if you have questions, want more information or have suggestions, please contact Eric Allen in the Office of Research Compliance at UNCG at (336) 256-1482. Questions that arise during this session can be directed to the research assistant who is here today. Questions, concerns or complaints about this project or benefits or risks associated with being in this study can be answered by Stephanie Doty, who can be reached at: s_doty@uncg.edu, or Rosemary Nelson-Gray, who can be reached at: (336) 334-5817. Any new information that develops during the project will be provided to you if the information might affect your willingness to continue participation in the project.

POTENTIAL BENEFITS:

By participating in this study, you will be exposed to (a) the process of conducting psychological research and (b) various questionnaires and other tasks that assess self-esteem, academic functioning, and cognitive functioning. This exposure may be beneficial if you enroll in courses that focus on research methodology. Broader benefits to society include gaining knowledge concerning the relationship between personality, self-esteem, and academic functioning, and cognitive functioning.

COMPENSATION AND COSTS:

Introductory psychology students will receive course credit for participating.

Specifically, you will receive 4 Experimetrix credits for completing the study. If at any time you choose to stop your participation, you receive 1 credit for every 30 minutes you complete or an additional portion of 30 minutes (e.g., if you choose to stop the study after 45 minutes, you would receive two credits).

CONSENT:

By signing this consent form you are agreeing that you have read it and you fully understand the contents of this document and are openly willing to consent to take part in this study. You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data which has been collected be destroyed unless it is in a de-identifiable state.

By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate in this study described to you by the Nelson-Gray lab research assistant who is running this session.

Participant's Signature

Date

APPENDIX B

DEBRIEFING SCRIPT

Thank you so much for participating in this study. When you first arrived it was explained to you that the experimenter was interested in how personality influences a variety of factors such as self-esteem, performance in school, and reaction time when competing against another person. As with some psychological research, this study is examining something other than what was initially described to you.

This study is actually examining the relationship between self-esteem, certain personality traits, and aggression. This study used an ego threat to examine whether certain levels of self-esteem predict aggression. The evaluation of your essay was not actually done by another participant; it was one of two comments made by the experimenter that was randomly chosen. The reaction time task that you completed was actually used as a way to measure your aggressive reaction to this “evaluation” of your essay.

It was essential that you were not aware of the true purpose of the study as it could influence how you reacted to the ego-threat. If you were aware of the true purpose of the study, you may have inhibited a desire to react aggressively towards the fictitious participant.

If you are experiencing any distress due to your participation in this study, please let the research assistant know and a list of mental health referrals will be provided to you. If you are experiencing significant distress and do not feel that this list of referrals is

sufficient, please let the research assistant know and he/she will immediately contact Stephanie Doty, who is a graduate student therapist or Rosemary Nelson-Gray, who is a licensed clinical psychologist.

If you have any questions, concerns or complaints about this project or benefits or risks associated with being in this study you can contact Stephanie Doty, who can be reached at: s_doty@uncg.edu or (336) 256-0058, or Rosemary Nelson-Gray, who can be reached at: (336) 334-5817.

We would like to sign an agreement that you will not divulge the actual experimental paradigm and purpose to other students. Your discussing this study with other students will make the study and its results invalid, so we would really appreciate your cooperation.

I _____ agree not to discuss this experimental paradigm or purpose with other students.

Signature _____ Date _____

Mental Health Referrals:

UNCG Counseling and Testing Center

Anna M. Gove Student Health Center, 107 Gray Drive 27412

Greensboro, NC 27402

336-334-5340

UNCG Psychology Clinic

1100 W Market Street

Greensboro, NC 27402

336-334-5662

Cone Behavioral Health Outpatient Services

700 Walter Reed Drive

Greensboro, NC 27403

336-832-9600

Triad Counseling and Clinical Services, LLC

806 Green Valley Rd., Suite 301

Greensboro, NC 27408

336-272-8090

Carolina Psychological Associates

5609-B W Friendly Ave

Greensboro, NC 27410

336-272-0855

APPENDIX C

TABLE OF RESULTS

Table 1

Descriptive Statistics for Study Variables

Variable	M	SD	Range	Cronbach's α
Pathological Narcissism Inventory	124.45	40.32	39.00 – 206.00	.949
Narcissistic Personality Inventory	16.82	6.73	4.00 – 33.00	.832
Rosenberg Self-Esteem	20.48	5.21	6.00 – 30.00	.882
Implicit Association Test	858.08	143.06	364.84 – 1342.85	.706
PANAS Before	12.79	5.56	1.00 – 24.00	.813
PANAS After	11.28	4.08	1.00 – 21.00	.769
Contingent Self-Esteem	24.67	14.45	1.0 – 58.0	.945
Exploitativeness	11.92	5.38	0.0 – 23.0	.824

Self-Serving Self-Enhancement	16.73	5.7	3.0 – 29.0	.760
Hiding the Self	20.09	6.88	2.0 – 33.0	.783
Grandiose Fantasy	21.83	8.12	2.0 – 35.0	.887
Devaluing	12.02	7.41	0.0 – 29.0	.853
Entitlement Rage	17.47	7.03	1.0 – 34.0	.738
Grandiose Narcissism	67.97	19.42	16.0 – 111.0	.888
Vulnerable Narcissism	56.47	24.9	7.0 – 114.0	.942
Aggression	5.361	2.29	1.0-10.0	

Table 2

Pearson Correlations

	A	PNI	NPI	RSES	IAT	CSE	EX	SSSE	HS	GF	DEV	ER	GR	VU
A	-													
PNI	.053	-												
NPI	.199*	.199*	-											
RSES	.215*	-.45*	.33**	-										
IAT	.007	.148	.033	-.061	-									
CSE	-.017	.91**	-.033	-.63**	.08	-								
EX	.067	.49**	.526**	.031	.106	.26**	-							
SSSE	-.052	.67**	.110	-.184	.08	.52**	.30**	-						
HS	-.070	.70**	.042	-.36**	.186	.60**	.21*	.42**	-					
GF	.151	.64**	.26**	-.114	.126	.49**	.26**	.50**	.32**	-				
DEV	.07	.71**	.058	-.46**	.077	.66**	.287**	.34**	.46**	.178	-			

ER	.153	.79**	.311**	-.22*	.133	.70**	.48**	.39**	.42**	.406**	.54**	-		
GR	.122	.88**	.402**	-.173	.15	.68**	.646**	.73**	.47**	.781**	.449**	.78*	-	
VU	-.009	.93**	-.01	-.61**	.12	.94**	.29**	.52**	.76**	.42**	.81**	.68**	.66**	-

Note. * indicates statistical significance at an alpha level of .05; ** indicates statistical significance at an alpha level of .01. A = Aggression, A = Agreeableness, PNI = Pathological Narcissism Inventory, NPI = Narcissism Personality Inventory, RSE = Rosenberg Self-esteem, IAT = Implicit Association Test, CSE = Contingent self-esteem, EX = Exploitativeness, SSSE = Self-sacrificing self-enhancement, HS = Hiding the self, GF = Grandiose fantasy, DEV = Devaluing, ER = Entitlement rage, GR = Grandiose narcissism, VU = Vulnerable narcissism.

Table 3

Manipulation Check

Multiple Regression Analysis Using Feedback to Predict Change in PANAS Score (n = 108)

Change was for Item 11 which was "Irritable"

Predictor Variable	B	SE B	β	R ²	f ²
<u>Step 1</u>				.034	0.035
Feedback	.663	.343	.184*		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R² = Variance explained by the model.

Table 4

Hypotheses 1

Multiple Regression Analysis Using Self-esteem to Predict Aggression (n = 108)

Predictor Variable	B	SE B	β	R ²	f ²
<u>Step 1</u>				.046	.048
Explicit Self-Esteem	.096	.042	.216*		
Implicit Self-Esteem	.000	.002	.020		
<u>Step 2</u>				.047	.049
Feedback	-.074	.442	-.016		
<u>Step 3</u>				.047	.049
ESE x ISE	.000	.000	.020		
<u>Step 4</u>				.061	.065
ESE x Feedback	.463	.455	.142		
ISE x Feedback	.319	.453	.096		
<u>Step 5</u>				.075	.081
ESE x ISE x					
Feedback	.000	.001	-.154		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R² = Variance explained by the model.

Table 5

Hypotheses 2

Multiple Regression Analysis Using Self-esteem to Predict PNI Narcissism Scores (n = 108)

Predictor Variable	B	SE B	β	R^2	f^2
<u>Step 1</u>				.218	.279
Explicit Self-Esteem	-3.427	.667	-.443***		
Implicit Self-Esteem	.033	.024	.118		
<u>Step 2</u>				.218	.279
Explicit Self-Esteem x					
Implicit Self-Esteem	.000	.004	-.005		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R^2 = Variance explained by the model.

Table 6

Hypotheses 2

Multiple Regression Analysis Using Self-esteem to Predict NPI Narcissism Scores (n = 108)

Predictor Variable	B	SE B	β	R^2	f^2
<u>Step 1</u>				.124	.14
Explicit Self-Esteem	.455	.118	.352***		
Implicit Self-Esteem	.002	.004	.048		
<u>Step 2</u>				.154	.182
Explicit Self-Esteem x					
Implicit Self-Esteem	-1.117	.001	-.175		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R^2 = Variance explained by the model.

Table 7

Hypotheses 3

Multiple Regression Analysis Using NPI Narcissism Scores to Predict Aggression (n = 108)

Predictor Variable	B	SE B	β	R^2	f^2
<u>Step 1</u>				.040	.0416
NPI	.068	.033	.199*		
<u>Step 2</u>				.040	.0416
Feedback	-.076	.442	-.016		
<u>Step 2</u>				.069	.074
NPI x					
Feedback	.121	.067	.279		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R^2 = Variance explained by the model.

Table 8

Hypotheses 3

Multiple Regression Analysis Using PNI Narcissism Scores to Predict Aggression (n = 108)

Predictor Variable	B	SE B	β	R^2	f^2
<u>Step 1</u>				.003	.003
PNI	.003	.005	.053		
<u>Step 2</u>				.003	.003
Feedback	-.058	.455	-.013		
<u>Step 2</u>				.005	.005
PNI x					
Feedback	.006	.011	.077		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R^2 = Variance explained by the model.

Table 9

Exploratory Analysis

*Multiple Regression Analysis Using Self-esteem to Predict Contingent Self-esteem Scores
(n = 108)*

Predictor Variable	B	SE B	β	R ²	f ²
<u>Step 1</u>				.401	.67
Explicit Self-Esteem	-1.746	.209	-.629***		
Implicit Self-Esteem	.004	.008	.041		
<u>Step 2</u>				.402	.67
Explicit Self-Esteem x					
Implicit Self-Esteem	.000	.001	-.019		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R² = Variance explained by the model.

Table 10

Exploratory Analysis

Multiple Regression Analysis Using Self-esteem to Predict Hiding the Self Scores (n = 108)

Predictor Variable	B	SE B	β	R^2	f^2
<u>Step 1</u>				.155	.183
Explicit Self-Esteem	-.459	.118	-.347***		
Implicit Self-Esteem	.008	.004	.162		
<u>Step 2</u>				.159	.19
Explicit Self-Esteem x					
Implicit Self-Esteem	.001	.001	.067		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R^2 = Variance explained by the model.

Table 11

Exploratory Analysis

Multiple Regression Analysis Using Self-esteem to Predict Devaluing Scores (n = 108)

Predictor Variable	B	SE B	β	R ²	f ²
<u>Step 1</u>				.219	.28
Explicit Self-Esteem	-.658	.122	-.462***		
Implicit Self-Esteem	.002	.004	.047		
<u>Step 2</u>				.221	.28
Explicit Self-Esteem x					
Implicit Self-Esteem	.000	.001	.049		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R² = Variance explained by the model.

Table 12

Exploratory Analysis

Multiple Regression Analysis Using Self-esteem to Predict Entitlement Rage Scores (n = 108)

Predictor Variable	B	SE B	β	R ²	f ²
<u>Step 1</u>				.066	.07
Explicit Self-Esteem	-.298	.127	-.221*		
Implicit Self-Esteem	.006	.005	.117		
<u>Step 2</u>				.067	.07
Explicit Self-Esteem x					
Implicit Self-Esteem	.000	.001	.023		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R² = Variance explained by the model.

Table 13

Exploratory Analysis

*Multiple Regression Analysis Using Self-esteem to Predict Vulnerable Narcissism Scores
(n = 108)*

Predictor Variable	B	SE B	β	R^2	f^2
<u>Step 1</u>				.373	.59
Explicit Self-Esteem	-2.863	.368	-.599***		
Implicit Self-Esteem	.014	.013	.082		
<u>Step 2</u>				.373	.59
Explicit Self-Esteem x					
Implicit Self-Esteem	.001	.002	.022		

Note. * indicates significance at an alpha level of .05, ** indicates significance at an alpha level of .01, *** indicates significance at an alpha level of .001, B = unstandardized beta coefficient, SE B = standard error, β = standardized beta coefficient, R^2 = Variance explained by the model.