

LEVEL AND INSTABILITY OF GLOBAL AND DOMAIN-SPECIFIC
SELF-ESTEEM AS DIFFERENTIAL PREDICTORS OF AGGRESSION

A Thesis

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In Partial Fulfillment

Of the Requirement for the Degree of

Master of Arts

by

Gregory Daniel Webster

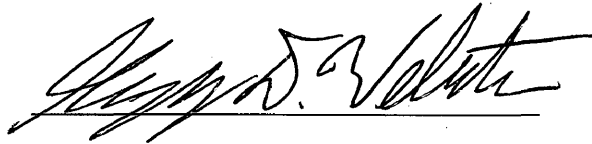
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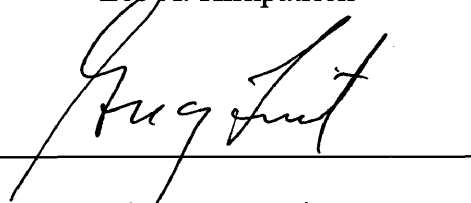
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ABSTRACT

The present study compared the predictive power of global self-esteem (SE) level and instability (Kernis, Grannemann, & Barclay, 1989) directly against that of a domain-specific SE model in predicting both self-reported hostility and behavioral aggression in a laboratory experiment (Kirkpatrick & Ellis, 2001).

Measurements were first obtained for each participant's trait global and domain-specific SE levels, followed by eight state SE measurements over the course of a week. The state measures allowed for the calculation of a measure of SE instability, which was also used to predict the aggression measures. Following this, participants self-reported their trait hostility. Finally, participants partook in a laboratory procedure similar to that used by Bushman and Baumeister (1998) and replicated by Kirkpatrick, Waugh, Valencia, and Webster (2001), in which a behavioral measure of aggression was obtained.

To compare the predictive validity of the global-instability model of SE with that of the domain-specific model, hierarchical regression analyses were performed on both the self-report hostility measures and the laboratory aggression measure. The results indicated that the domain-specific model reliably explained more of the variance in the dependent measures than the global-instability model in most of the analyses.

LEVEL AND INSTABILITY OF GLOBAL AND DOMAIN-SPECIFIC
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Introduction

Although a great deal of research has been performed on self-esteem (SE) and on aggression, surprisingly little has focused on the relationship between the two (Baumeister & Boden, 1998). The relationship between SE and aggression has been of particular interest lately, as people search for explanations of such violent acts as school shootings. Although it may be a widely held belief in folk psychology, lower SE is not necessarily associated with more aggressive behavior. In a review of the empirical literature, Baumeister and Boden (1998; Baumeister, Smart & Boden, 1996) have suggested that the relationship between self-esteem and aggression have produced mixed results across studies. They conclude that, if anything, higher levels of SE are associated with higher aggression than lower levels of SE.

Baumeister and Boden (1998) have proposed two possible moderators of the SE-aggression relationship: (a) situational variables, which either promote or deter aggression, and (b) the level of self-reported narcissism. Kirkpatrick, Waugh, Valencia, and Webster (2001) expanded on this model to include multiple domains or types of SE. For example, people might be more or less likely to aggress against an insulter depending on whether or not their peers are present. This reaction, in turn, may depend on whether people feel they are accepted or shunned by their peers. Bushman and colleagues have explained aggressive reaction to these factors in terms of threatened egotism (i.e., "favorable views of the self that are disputed or that in some other way encounter an external appraisal that is far less favorable"; Baumeister & Boden, 1998, p. 114). The

crucial situational factor identified in their model is the perception of ego threat: "When favorable views about oneself are questioned, contradicted, impugned, mocked, challenged, or otherwise put in jeopardy, people may aggress. In particular, they will aggress against the source of the threat" (Baumeister et al., 1996, p. 8).

According to this view, people who have artificially inflated or unstable self-perceptions are more susceptible to ego threat. As summarized by Baumeister and Boden (1998, p. 114), "violent, aggressive people tend to be arrogant, conceited, egotistical, narcissistic, or otherwise enamored of themselves." In other words, people who are self-aggrandizing are typically more aggressive than those who are not.

To empirically test this explanation, Bushman and Baumeister (1998) examined global SE and narcissism as predictors of aggression in a competitive reaction-time laboratory experiment across two studies. First, students completed Rosenberg's (1965) SE scale as a measure of global SE and Raskin and Terry's (1988) Narcissistic Personality Inventory (NPI) as a measure of the arrogant qualities that should be related to ego threat. Next, participants received either positive or negative feedback concerning the quality of the essays they had written for the experiment (ostensibly from another participant). When students were given the opportunity to aggress (ostensibly) against their evaluators with loud noise blasts in a competitive reaction time game, those with higher scores on the NPI were more aggressive, especially in the negative feedback condition. In the second study, when students were given the opportunity to aggress against an innocent third party (i.e., a person who was ostensibly not their evaluator), the

significant NPI effect disappeared. Interestingly, global SE was unrelated to the feedback manipulation and the aggression measure in both studies.

One possible reason for the null effect of global SE is that it is too broad of a construct. If there are multiple specific domains of SE that are related to aggression, these domains might predict aggression differentially, but cancel each other out when aggregated into a more general construct, such as global SE. In other words, global SE may not be an effectively diagnostic construct in predicting aggression. Given this reason, a domain-specific approach to SE using reliable SE scales might provide a more accurate picture of SE's relationship with aggression than either global SE or narcissism.

The Sociometer Model

What purpose does SE serve? Some researchers have proposed that an individual's SE is analogous to an automobile's fuel gauge (Leary & Baumeister, in press; Leary, Tambor, Terdal, & Downs, 1995). Leary and colleagues argue that people typically ignore their SE level unless it becomes noticeably low, just as drivers generally ignore their fuel gauge unless or until it becomes low enough to cause concern. When the SE or fuel level reaches a certain point, the person becomes aware of the deficit and attempts to change it via behavioral or situational change, or, in the case of the fuel gauge, purchasing more gasoline.

Leary and colleagues (Leary & Baumeister, in press; Leary et al., 1995) believe SE serves as an internal gauge or "sociometer" that reflects a person's own perceptions of how others feel about them. In other words, SE is an interpersonal-relationship, cognitive-monitoring device, or "sociometer." More specifically, they argue that this

sociometer is especially sensitive to social acceptance and rejection. Evolutionarily, individuals possessing the most accurate sociometers would likely have selective advantages, because they would be able to (a) gauge their current place or worth in a social structure and (b) act to remedy their behavior or situation if their sociometer fell too low. These advantages would likely result in an individual's better acceptance within a group, which would in turn promote a better chance of survival and successful mating.

Leary and others have provided empirical support for their sociometer hypothesis in a series of experiments (Leary et al., 1995). First, changes in participants' state-based SE in reaction to various events were related to their assumptions about whether such events would influence others to reject or accept them. Second, a measure of social "belongingness" or inclusion correlated strongly with a measure of SE. Third, exclusion from a group activity on personal grounds negatively impacted participants' SE levels, whereas random exclusion produced no change in SE.

In one study, Leary and Cottrell (1999) demonstrated that measures of social acceptance accounted for a greater amount of unique variance in trait global SE (Rosenberg, 1965) than did other measures such as inventories of social dominance. Leary and Cottrell concluded that, while some sort of sociometer to measure social acceptance is present in nearly everyone, an internal mechanism for gauging relative dominance might be present only in certain individuals.

The Domain-Specificity of Self-Esteem

One theoretical approach that has attempted to shed light on the self-esteem and aggression relationship has been the emerging field of evolutionary psychology. Taking a

largely functionalist perspective on behavior, Kirkpatrick and Ellis (2001) have suggested that SE may serve as a suite of cognitive adaptations for self-evaluation, designed to gauge an individual's well-being on multiple levels and in multiple social contexts. Since a singular, all-encompassing SE gauge would likely work for only a few of the many survival and social problems faced by ancestral humans, it is more plausible that several, specific SE gauges have evolved over time to provide specific solutions to specific adaptive problems. Consequently, SE should be thought of as more than simply a global construct.

Evolutionary psychologists such as Kirkpatrick and Ellis (2001; Tooby & Cosmides, 1992) have argued that cognitive adaptations evolved to solve specific adaptive problems such as survival and reproduction in much the same way physical structures, such as organs, develop to solve specific bodily functions. For instance, neural circuitry that in some way benefits the reproductive fitness of its bearer in one generation, should be present in a greater frequency in subsequent generations. Thus, the structures that guide patterns of human thought are as much product of natural selection as structures that allows humans to grip with their thumbs.

Kirkpatrick and Ellis (2001) believe that a generalized self-evaluation gauge of SE would be maladaptive, because humans are faced with specific—rather than generalized—day-to-day problems. For example, an experienced mechanic will often have an arsenal of various tools at his disposal—each with its own specific function—rather than one, all-purpose tool that is limited in the scope of what it can fix.

The adaptive problems faced in human ancestry were likely varied and specific. Examples of such problems include survival, obtaining food, shelter, and other resources, forging social alliances at micro- and macro-levels, and finding and retaining mates. Obviously, a gauge that evolved for monitoring one's general self-worth would have a difficult time trying to accurately and simultaneously gauge such diverse and specific needs as mate retention, within-group competition, and social support.

Such domain-specific SE components may include social inclusion and social dominance, as Leary and colleagues have suggested (Leary & Baumeister, in press; Leary & Cottrell, 1999; Leary et al., 1995). In addition, Kirkpatrick and Ellis have proposed several other possible domain-specific types of SE, including those related to problems of within-group competition (e.g., mate value, social dominance, social inclusion, perceived superiority), and others that attempt to solve between-group competition problems (e.g., collective or coalitional SE). This theoretical perspective leads to a variety of predictions about SE and its relation to other psychological variables, including aggression.

Returning to Leary et al.'s (1995) enlightening analogy of the sociometer as a fuel gauge, it would stand to reason that a gauge to measure an automobile's overall "health" is functionally impractical and prognostically inefficient (Kirkpatrick & Ellis, 2001). Most cars come equipped with numerous instrument gauges that measure specific areas of the car's functioning (e.g., speedometer, tachometer, engine temperature, oil pressure, battery power, fuel amount). Likewise, if the function of SE is an adaptive self-evaluation device, it should stand to reason that several specific gauges of SE exist; each

designed through natural selection to measure the well-being of the individual in several specific aspects of his or her life.

Although it would be difficult to know exactly how many domains of SE have evolved, we can examine the most important or frequent problems affecting our daily lives for insight into what mechanisms have evolved to help monitor and solve these problems. Among the domain-specific constructs proposed by recent literature are: social inclusion, social dominance, mate value, superiority to others, and collective SE (Kirkpatrick & Ellis, 2001; Leary & Cottrell, 1999; Leary et al., 1995; Luhtanen & Crocker, 1992; Pelham & Swann, 1989; Williams, 1998, 1999). One way to examine whether these domain-specific SE constructs are more diagnostic in predicting aggression than global SE would be to replicate the laboratory experiments of Bushman and Baumeister (1998) using the proposed domain-specific measures in addition to Rosenberg's (1965) SE inventory.

Empirical support for a domain-specific approach to aggression. Kirkpatrick, Waugh, Valencia, and Webster (2001) have recently performed a series of studies that have largely confirmed (a) the relative independence of the aforementioned domain-specific SE constructs in contributing to the variance in global SE and (b) that the domain-specific SE approach predicts aggression more reliably than global SE.

In their first study, Kirkpatrick et al. (2001) regressed five domain-specific SE measures (i.e., mate value, superiority, social dominance, social inclusion, and collective SE) simultaneously on global (Rosenberg, 1965) SE. Of these, mate value, superiority, and social inclusion were significant, positive predictors of global SE level, while social

dominance was a marginal, positive predictor. This result demonstrated that each domain of SE contributed independently and additively in predicting global SE. Consequently, Kirkpatrick et al. decided to test the predictive validity of the domain-specific measures in two laboratory aggression experiments similar to those of Bushman and Baumeister (1998).

In their first experiment, Kirkpatrick et al. (2001) attempted to replicate the Bushman and Baumeister's (1998) by using a similar essay writing and feedback manipulation methodology. Participants were asked to take either a pro-life or pro-choice stance on the abortion debate and write essays defending their views. The students were then given an essay to evaluate (which ostensibly came from another participant) that was either similar or dissimilar to their abortion views. Students then received either positive or negative feedback on their essays (which ostensibly came from another participant). In place of the competitive reaction time game, Kirkpatrick et al. employed a novel measure of behavioral aggression developed by Lieberman, Solomon, Greenberg, and McGregor (1999). The Lieberman et al. method involves measuring the amount hot sauce a person allocates for their insulter to consume, rather than the more traditional aggression paradigms of auditory punishment (e.g., noise blasts) or tactile punishment (e.g., electric shock). In the Kirkpatrick et al. experiments, participants were led to believe they were preparing a hot sauce sample for their evaluator involving an elaborate cover story. The weight of the hot sauce allocated was the dependent measure of aggression.

Results from the first experiment indicated that one domain-specific SE measure, self-perceived superiority (called Self-Attributes Questionnaire by its developers, Pelham

& Swann, 1989), was a significant positive predictor of aggression, whereas another measure, social inclusion (Leary & Cottrell, 1999) was a significant negative predictor of aggression. Just as in Bushman and Baumeister's (1998) experiment, global SE did not predict aggression. In other words, insulted participants were more likely to exact revenge on their perceived evaluators if they had pre-tested high for perceived superiority. Participants who rated themselves high on social inclusion were the least likely to aggress when insulted. Kirkpatrick et al. (2000) suggested that this result highlights the distinctness of certain SE domains as functionally separate cognitive mechanisms in an aggression context.

In a separate but similar experiment, Kirkpatrick et al. (2001) attempted to create a mate-competition context by leading participants to believe they were competing to work with an opposite-sex partner in a sort of "dating game" scenario. In this scenario, people were asked to write an essay about themselves with the goal of attracting the interest of a person of the opposite sex. Participants were told that a (fictional) opposite sex participant would choose between them or another participant of the same sex to work with in the (fictional) next round of the experiment based on their essays. Participants were allowed to (ostensibly) evaluate their competitors' essays and (ostensibly) received either positive or negative feedback on their essays from their (fictional) competitors. This was again followed by the hot sauce phase of the experiment. In this sample, people that pre-tested higher for mate value—that is, self-perceived attractiveness—were subsequently more aggressive. Thus, Kirkpatrick et al. successfully tapped the mate value domain by performing the experiment as a mating game. Together, these two laboratory

experiments demonstrated that particular domain-specific SE constructs could be specifically targeted for insult based on the surrounding social context. In short, a domain-specific SE approach reliably predicted aggressive behavior, whereas a global SE perspective did not.

Instability of Self-Esteem

Another perspective on the relationship between SE and aggression has examined the instability of global SE over time. While the Kirkpatrick et al. (2001) experiments explored the question of SE domain-specificity, other research has focused on understanding the instability of SE and its unique role in explaining human behavior, including aggression. The majority of SE research is conducted with global SE level as its primary variable of interest. However, a measurement of global SE instability over time can provide a wealth of information about SE variability, which may be more relevant to some behaviors than a one-time, trait measure of global SE level.

How does one measure SE instability? The most efficient way is to have people self-report their perceived instability directly (Rosenberg, 1965). However, an arguably more accurate and reliable way of measuring people's SE instability is to obtain a measurement of their state SE level on several different occasions in a repeated-measures design. Using this model, a measure of an individual's SE instability can be defined as the standard deviation of their state SE means across time.

Using this method, a great deal of research has been performed on the short-term instability of global (Rosenberg, 1965) SE over time (e.g., Gable & Nezlek, 1998; Greenier, et al., 1999; Kernis, Cornell, Sun, Berry, & Harlow, 1993; Kernis,

Grannemann, & Barclay, 1989, 1992; Kernis, Greenier, Herlock, Whisenhunt, & Abend, 1997; Kernis, Grannemann, & Mathis, 1991; Kernis, et al., 1998; Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000; Roberts, Kassel, & Gotlib, 1995; Webster, 2000). Kernis and his various colleagues have generally employed similar methodologies and procedures to examine SE instability. Participants are first asked to complete a pretest consisting of the ten traditional Rosenberg (1965) SE items on five-point scales. This pretest serves as a sort of baseline measure or “trait” measure of SE level. The participants are then asked to complete the same Rosenberg SE items on ten-point scales eight times over the course of a week, but with the specific instruction to reply to the statements using exclusively their current state of mind (i.e., to obtain “state,” rather than “trait” self-ratings of SE). This repeated-measures design allows for the examination of short-term fluctuations in state SE across time—a good mathematical measure of SE instability. After the completion of these studies, correlations between trait SE level (i.e., the pretest or baseline SE level) and SE instability (i.e., the standard deviation of the eight state SE means) are calculated. The mean of the eight state SE means is often calculated as an alternate index of trait SE.

Although no studies to date have examined the relationship between SE instability and a behavioral measure of aggression in a laboratory experiment (like Bushman and Baumeister’s 1998 study), one study has predicted self-report hostility using SE instability. In this study, Kernis et al. (1989) found that instability of SE was just as influential, and in some cases more so, than SE level when predicting self-reported hostility. Kernis et al. found that the Buss-Durkee Hostility Inventory (BDHI; Buss &

Durkee, 1975) and its Motor and Attitude components could be reliably predicted by trait global SE level, global SE instability, and their interaction. Global SE instability was a significant positive predictor of BDHI Total and Motor, but not Attitude, which was marginally predicted by trait global SE level. Interestingly, Kernis et al. observed the interaction of global SE level and instability to be a marginal predictor of BDHI Motor. Kernis et al. then performed a similar set of regressions on the BDHI components using mean state global SE in place of trait global SE. In these regressions, global instability predicted BDHI Total marginally and BDHI Motor significantly, but not BDHI Attitude, which was marginally predicted only by mean state global SE. These main effects were not qualified by the global SE instability x mean state global SE interaction for any of the BDHI components. In relation to the BDHI components, Kernis et al.'s results differed little from Bushman and Baumeister's (1998) findings, where global SE failed to predict aggression in a laboratory experiment.

The Current Study

There are many ways to measure self-esteem, and it remains unclear as to what type of SE measure or perspective is the most reliable in predicting aggression. Bushman and Baumeister (1998) demonstrated that narcissism, but not global SE predicted aggression in a laboratory experiment. Kernis et al. (1989) employed a measure of SE instability, which was related to certain types of self-reported hostility. Kirkpatrick et al. (2001) have shown that a domain-specific approach to SE may be the most diagnostic when predicting behavioral aggression.

According to Kernis et al. (1989), a model using global SE level, its instability, and their interaction, is better at predicting certain forms of self-reported hostility than using trait global SE alone. However, this global-instability model has not been applied to a behavioral measure of aggression in a laboratory experiment. Likewise, Kirkpatrick and colleagues' domain specific SE model has not yet been tested for its ability to predict self-reported hostility. One way to assess differences in the predictive validity of these models would be to measure global SE level, its instability, and domain-specific SE, in order to predict both self-report hostility and behavioral aggression within the same study.

The primary objective of the present study was to compare the global SE level and instability model of Kernis with the domain-specific SE model employed by Kirkpatrick and colleagues in their ability to predict both self-report hostility and behavioral aggression in a laboratory experiment. First, it was hypothesized that the findings of Kernis et al. (1989) would be replicated. Specifically, global SE level, its instability, and their interaction should, in some combination, significantly predict measures of self-reported hostility. However, it was also hypothesized that the domain-specific SE model would be able to predict above and beyond Kernis' model across the hostility measures. Second, when the dependent variable is behavioral aggression, it was hypothesized that global SE should not be a reliable predictor, as demonstrated by Bushman and Baumeister (1998). It was unclear what effect, if any, global SE instability might have, given that it has not been used to predict aggression in a laboratory

experiment. Again, it was proposed that the domain-specific SE model should explain more of the variance in the aggression measure than the Kernis model.

Method

The general procedure of this study went as follows: (a) measurement of trait SE on a single occasion; (b) eight repeated measures of state SE, which were used to gauge participants' SE instability; (c) measurement of self-reported hostility; and (d) the experimental phase, which included a SE insult and a behavioral measure of aggression in a laboratory session.

Participants

Participants were 109 students (54 men, 55 women) enrolled in Introductory Psychology courses at the College of William & Mary. Students were solicited via posted sign-up sheets. All received class credit in exchange for their participation. Of these students, 41 were in dating relationships at the time of the study; 68 were not.

Materials and Procedure

All state and trait SE and trait hostility materials were made available to participants on an Internet web site, where they responded to the items according to a schedule. Participants were instructed in the use of the web site and the importance of the schedule during one of four twenty-minute information sessions held in a classroom. At the session, they were given a handout that summarized the study's instructions and the schedule they were to keep (see Appendix A). The web site allowed participants the luxury of entering their data from virtually any computer with Internet access. More

importantly, this procedure allowed all data collection sessions to be time-stamped, which lead to a high rate of compliance with the daily schedule (outlined below).

Measurement of Trait Self-Esteem. Six different types of SE inventories (see Appendices B through H) were used in the current study: (a) the 10-item Rosenberg (1965) scale for assessing global self-esteem; (b) the 9-item Inclusionary Status Scale (Spivey, 1990) and the 10-item Interpersonal Support Evaluation List (Cohen, Mermelstein, Kamarck, & Hoberman, 1985) were combined to measure social inclusion; (c) Pelham and Swann's (1989) 10-item Self-Attributes Questionnaire, on which participants rate themselves in terms of percentile ranks on ten socially desirable characteristics (hereafter referred to as self-perceived superiority or simply, superiority); (d) a ten-item measure of social dominance adapted by Leary and Cottrell (1999) from the California Psychological Inventory (Megargee, 1972); (e) a 12-item measure of self-perceived mate value developed by Williams (1998, 1999); (f) the 16-item Collective Self-Esteem (CSE) scale developed by Luhtanen and Crocker (1992), referred to as collective SE. Responses to all scales were provided on standard five-point Likert-style scales, with anchors of 1 = strongly disagree to 5 = strongly agree, except superiority, which used a 10-point scale (see Appendix E). The order of presentation of each item across these six inventories was randomized for both trait and state assessment using a Latin square design. The trait measures were collected only once, at the start of the study.

Measuring Self-Esteem Instability. To measure the instability of some of these self-esteem measures over time, abbreviated inventories were constructed based on their items' factor loadings, intra-scale reliability, and appropriateness for repeated use

(Webster, 2000). A total of 4 items were taken from each of the following inventories: mate value, social dominance, superiority, inclusionary status, and social support. (Selected items are followed by an asterisk in Appendices B through H.) The CSE subscales had four items each, so no item reduction was required for daily administration. To replicate the methods of Kernis and colleagues, all ten global SE items were included. Responses to all state SE scales were provided on ten-point Likert-style scales, with anchors of 1 = strongly disagree to 10 = strongly agree.

Participants were asked to complete these abbreviated inventories a total of eight times over the course of a week. The schedule they kept was based on Kernis and colleagues' methodology of a strict 12-hour interval schedule: Monday at 10 p.m., Tuesday through Thursday at 10 a.m. and 10 p.m., and Friday at 10 a.m. This repeated-measures design allowed for the examination of short-term fluctuations in SE level across time.

Not surprisingly, these instability coefficients typically yield highly positively skewed frequency distributions, which often violate normality assumptions for statistical tests (see Webster, 2000). Although Kernis and colleagues have not done so in the past, the instability coefficients in the current study were transformed using a natural logarithmic transformation (i.e., $\ln(\underline{SD} + 1)$). These resulting variables in the current study are referred to as transformed instability coefficients (TICs). In certain instances where the current study's results are used in comparison with previous studies (such as Kernis'), the original, raw instability coefficients (RICs) are used.

Self-reported measure of hostility. Following the final session on Friday, students were directed to another web site, where they completed the trait-based Buss-Durkee Hostility Inventory (BDHI) consisting of seven sub-scales (Buss & Durkee, 1957; see Appendices I through O).

Experimental Phase. Three to five weeks after the self-report hostility data had been collected, the participants were scheduled for the experimental phase in groups of three to six at a time. Two experimenters quickly led participants into cubicles off of a central room upon their arrival to prevent interaction between participants. The students were told they were participating in a study about "attitudes and taste preferences." (The experiment's procedures, with the exception of the essay topic, were taken from Bushman & Baumeister, 1998. See Appendix P for all instructions given to participants.)

For the "attitudes" part of the study, participants were asked to write a short essay about what they saw themselves doing five years in the future (see Appendix Q). It was thought that such an essay topic would be very self-relevant, and any insult to such a personal writing would be interpreted as a general insult. This essay topic procedure reflected the self-relevance of Kirkpatrick et al.'s (2001) second experiment while preserving the non-competitive situational atmosphere of their first experiment. Moreover, this alteration avoided the complexities of having the participants write about abortion. The completed essays were then taken away and the participants were led to believe that they were being paired with another participant of the same sex in another cubicle, and that they would be evaluating each other's essays (ostensibly to save the experimenters some time). Participants then received the essay ostensibly written by the

other participant (which was prepared by the experimenters earlier; see Appendix Q) and asked to evaluate the essay on a series of scales (Appendix R). Participants were also informed (ostensibly) that their evaluations of their partner's essay would be exchanged with their partner, so that each participant would get to see the feedback their partner provided on their essay.

After about a minute, the experimenter returned and handed the participants the feedback their partners had (ostensibly) produced. These essay evaluations consisted of bogus ratings and constituted the ego threat (feedback) manipulation. Half of the participants received negative ratings with respect to organization, originality, writing style, and overall quality. At the bottom of the scale was a handwritten remark stating, "Weak essay. I didn't like it." The other half of the participants received positive ratings on the above attributes and a handwritten comment that stated, "Great essay. No suggestions."

Hot-Sauce Procedure. Next, participants were informed that in the final part of the study they were to taste and evaluate a food sample—either "dry foods" or "spicy foods" depending on random assignment. To give participants the illusion of control over their random assignment, the experimenters asked each participant at this point in the study to simply say either "spicy" or "dry." Regardless of their response, the experimenters replied with, "You have been randomly assigned to receive a dry food sample from your partner and prepare a spicy food sample for them." In addition, the participants were told that they were to prepare the food samples for each other because the experimenters needed to be blind to the sample type and quantity of food tasted. Moreover, it was made

clear that to the participants that they were to be paired with the same student they were paired with for the attitudes study, for convenience and to avoid confusion among the different experimenters. (These and all other details follow exactly Lieberman et al., 1999.)

Next, participants completed a "taste preference inventory," on which they reported their liking for salty, spicy, dry, sweet, sour, and creamy foods on 21-point scales (Appendix S). At this time, they were also asked, as a precaution, if they had any food allergies. After a few moments, the experimenters returned to collect the taste preference inventories (ostensibly) to deliver them to their partners. A few minutes later, the experimenters returned with a single saltine cracker in an envelope (the dry food sample), which was (ostensibly) prepared by each participant's partner. Participants were instructed to consume the entire cracker and evaluate its taste on three scales ranging from 1 (complete dislike) to 9 (extreme liking) on the following qualities: appearance, aroma, taste, texture, and overall satisfaction (Appendix T).

After a few minutes, the experimenter returned with a tray containing all of the hot sauce-allocation materials. The participants were instructed to prepare a sample of hot sauce to give to their partner (who ostensibly had been randomly assigned to the spicy-foods condition). The experimenter then mentioned that people are often curious about the taste preferences of others, so the participants were shown the taste preference responses of the other person (which were prepared in advance by the experimenters). The completed form indicated that the other participant disliked spicy foods, which were

rated lowest among the presented taste items (i.e., gave a rating of 3 on the 21-point liking scale for "spicy").

Participants were then instructed to use a plastic spoon to place a quantity of the hot sauce into the bowl and seal it with the lid provided. They were told that any and all quantities of hot sauce were useful and that they should put in as little or as much as they want. It was also made clear (subtly) to the participants that their partner would be asked to consume the entire amount of hot sauce that they allocated. To be sure that the participants were aware of the intensity of the hot sauce, they were instructed to use a small spoon to taste it. Participants were also asked to write their partner's experiment identification number on the cup containing the allocated hot sauce sample. Before leaving the room, the experimenter handed the participants a checklist of the steps involved in allocating the hot sauce to ensure no errors would be made in the procedure (Appendix U). Shortly thereafter, the experimenter returned to collect and (ostensibly) deliver the hot sauce to each participant's partner. A moment later, the experimenter returned to ask each participant if they believed the feedback that they had received in fact came from their partner. Those participants who doubted the legitimacy of their essay feedback ($N = 15$) were dropped from experimental analyses. Each participant was then handed a debriefing on the experiment to read and asked if they had any questions or concerns (see Appendix V).

Other Materials. Hot sauce was prepared following the exact recipe designed by Lieberman et al. (1999). Other materials for the hot sauce part of the experiment included small plastic spoons for participants to use in allocating hot sauce samples and for tasting

the hot sauce themselves; Styrofoam bowls (12 fluid oz.) into which the hot sauce samples were allocated; saltine crackers for participants to taste as part of the bogus taste-preferences task; envelopes in which the saltine crackers were delivered to participants; and a digital scale to weigh the hot-sauce samples.

The hot sauce samples were weighed in the Styrofoam bowls using the digital scale. The average weight of an empty bowl was calculated and subtracted from the total weight of the hot sauce and the bowl, leaving the actual weight of the hot sauce in grams. The frequency distribution of these hot sauce weights was highly positively skewed. As a result, the hot sauce weights were transformed by adding a gram to them, and then taking the natural log of this sum (i.e., $\ln(\text{grams} + 1)$). These transformed hot sauce weights became the dependent measure of aggression used in all analyses of the experimental phase. Subsequently in this study, the term “hot sauce weight” will refer exclusively to the transformed weights, not the raw weights (except in Table 1, where descriptive statistics of both measures are given for convenience).

Results

Relationships Among the Self-Esteem Measures

The descriptive statistics for all trait and mean state SE measures, and their respective transformed instability coefficients (TICs), are presented in Table 1, along with the BDHI and hot sauce weight statistics. Correlational analyses between the six trait SE measures revealed that all were positively and significantly correlated with one another ($ps < .01$; see Table 2). In addition, all trait SE scales were fairly reliable (reliability coefficients ranged from .71 to .90). Correlations among the mean state SE

scales revealed a similar pattern of strong positive correlation ($p_s < .01$; Table 3). The state SE scales were highly reliable over time (from .95 to .98) and were strongly related to their respective trait scales (validity coefficients ranged from .77 to .89), with the possible exception of social dominance (.60). (Procedures for calculating the reliability and validity of such measures are described in Bryk & Raudenbush, 1992, pp. 43-44 and p. 65, respectively.) Correlations among the TICs of the six SE domains revealed that all were reliably, positively related to one another ($p_s < .01$; Table 4).

Correlations between the SE trait levels and the SE TICs are displayed in Table 5. Overall, the TICs shared a negative relationship with the vast majority of the trait SE measures. This pattern demonstrated that the correlations between trait domain-specific SE levels and domain-specific TICs are mostly negative, similar to the correlations Kernis and colleagues have observed between global SE and its instability. Trait-level mate value was related to more of the TICs (i.e., global SE, superiority and social inclusion) than any other trait SE measure. The TICs of both global SE and superiority were significantly related to at least half of the trait SE domains, particularly the “competitive” SE domains (i.e., mate value, superiority, and social dominance). These results suggested that a domain-specific approach to both SE trait level and instability might be more diagnostic than a simple measure of trait global SE and its instability.

Correlations between the dependent measures of the three BDHI composite scales and the transformed hot sauce weights revealed the BHDI scales to be strongly correlated with each other ($p_s < .01$), but all three were unrelated to the hot sauce measure (Table 6). The result suggested that either (a) the BDHI and the hot sauce measure of aggression

were fundamentally unrelated in terms of what they measure or (b) participants' attitudes and behaviors are inconsistent regarding hostility and aggression.

To determine whether variation in trait global SE can be explained through a domain-specific approach, hierarchical regression analyses were performed on trait global SE with trait domain-specific SE predictors (see Table 7, left columns), and on global TICs with domain-specific TIC predictors (see Table 7, right columns). These analyses paralleled those used in Kirkpatrick et al.'s (2001) first study, in which global SE was regressed on the domain-specific SE scales. At Step 1, the group variables of sex and relationship status were entered into the regression equation. (Sex was coded $-1 =$ female, $1 =$ male; relationship status was coded $-1 =$ not in a relationship, $1 =$ currently in a dating relationship.) Sex was included because it is a frequently used variable in SE research. Relationship status was included because Webster (2000) demonstrated that it was marginal predictor of global SE, with people in relationships having higher global SE on average than those who were not. In this model, both group variables reliably predicted trait global SE level, with men and people in relationships rating themselves higher (for sex, $\beta = .27$; for relationship status, $\beta = .30$; $p_s < .01$). When the five domain-specific trait SE measures were added at Step 2 (depicted in Table 7, left column), the group effects were attenuated ($p_s > .15$), and the three "within group competition" SE domains (i.e., mate value, superiority, and social dominance) became significant predictors of trait global SE ($p_s < .02$). The domain-specific model explained significantly more variance in trait global SE than the group-variables model ($\Delta R^2 = .47$, $F(5, 101) = 24.98$, $p < .001$).

To explore whether the above results involving trait SE level can be generalized to SE instability, a similar hierarchical regression was performed on global SE instability (TICs) using the same group variable at Step 1 and the domain-specific TICs as predictors in Step 2 (see Table 7, right columns). At Step 1, women ($M = 0.51$) displayed significantly more global SE instability than men ($M = 0.41$, $SEs = 0.03$; $\beta = -.23$, $p < .02$), whereas relationship status was not a significant predictor ($p > .25$). At Step 2, the TICs of the two “social acceptance” SE domains (i.e., social inclusion and collective SE) were positive predicts of global SE instability ($ps < .01$), along with sex, which remained a reliable predictor ($\beta = -.14$, $p < .05$). Again, the domain-specific model explained significantly more of the instability in global SE than did sex and relationship status alone ($\Delta R^2 = .55$, $F(5, 97) = 27.96$, $p < .001$). These results demonstrated the unique contribution of the domain-specific measures in predicting variance in global SE level and instability.

Self-Esteem Measures and Self-Reported Hostility

Kernis et al. (1989) examined the relationship between trait global SE, its instability (using raw instability coefficients or RICs), and hostility, using the BDHI. In addition to employing the BDHI as a whole (i.e., BDHI Total) Kernis et al. also used two composites of BDHI subscales, which he called BDHI Motor and BDHI Attitude. The Motor component averaged items across four BDHI subscales: Assault, Indirect Hostility, Verbal Hostility, and Irritability. The Attitude component averaged items across the Resentment and Suspicion subscales. In the current study, trait global SE, its TIC, and the domain-specific scales were all reliably correlated only with BDHI Attitude (except for

collective SE, which was unrelated to any BDHI component; see Table 8). These Correlations were all negative in direction, suggesting that people with lower trait SE had more hostile attitudes than those with higher SE levels. However, people with higher global SE instability (TICs) also tended to have more hostile attitudes than those who were more stable. Interestingly, the domain-specific trait SE scales were unreliably correlated with the transformed hot sauce weights.

One of the purposes of the current study was to replicate the Kernis et al.'s (1989) results (outlined earlier) using the same variables they used in their analyses. (For these analyses only, RICs were used instead of TICs, for the sole purpose replicating Kernis et al.'s 1989 findings.) For the trait global SE analyses on the BDHI components, only one of Kernis et al.'s (1989) findings was reproduced: trait global SE level was a significant (as opposed to marginal), negative predictor of BDHI Attitude ($\beta = -.22, p < .05$). None of Kernis et al.'s findings concerning global RICs, or their interaction with trait global SE level, was reliably replicated ($ps > .15$). Mean state global SE was a marginal predictor of BDHI Total ($\beta = -.22, p < .10$) and a significant predictor of BDHI Attitude ($\beta = -.34, p < .01$). Again, none of the global RICs, or their interaction with mean state global SE, produced reliable results ($ps > .25$). (Replacing Kernis et al.'s RICs with TICs did not alter these results.)

Interestingly, the results involving the effects of trait and mean state global SE level on the BDHI components were fairly comparable between studies, whereas the effects involving global SE instability, and the interaction term, were not. This could have been due in part to the fact that both the trait and mean state global SE correlations

with global RICs were stronger in the present study (-.33 and -.47, respectively) than in Kernis et al.'s (1989) study (-.10 and -.38, respectively). However, neither correlation pair differed significantly between studies ($z_s = -1.32$ and -0.60 , respectively; $p_s > .15$). Another possibility was that the sample means of the self-report measures differed markedly between the current study and those reported by Kernis et al. However, none of the five common measures (i.e., the three BDHI composites, trait global SE level, and global SE RICs) differed significantly between the two studies ($t_s < 1.51$, $p_s > .10$). Perhaps this discrepancy was related to the fact the current study's participants knew that their daily sessions were being time stamped and were thus more motivated to complete the SE inventories regularly than Kernis et al.'s participants, whose timeliness could not be validated. Moreover, the current investigation employed more than twice as many participants ($N = 105$) as Kernis et al.'s study ($N = 45$). Thus, it could be argued that the results of the present study are more robust than those of Kernis et al.

To compare the predictive value of the Kernis et al. (1989) model (i.e., trait global SE and its instability) with that of a domain-specific SE approach in predicting self-reported hostility, separate hierarchical regressions were performed on each of the three BDHI components. Each hierarchical regression involved three steps. At Step 1, sex and relationship status were entered into the equation. At Step 2, the global-instability model variables of trait global SE level and global SE TICs were entered. (Since the global SE level x global SE instability interaction was not observed earlier with these data, this interaction term was dropped from all subsequent analyses.) Finally, at Step 3, the five trait domain-specific SE scales were added to the model. The results of the final step of

these hierarchical regressions on BDHI Total, Motor, and Attitude are presented in three sets of columns in Table 9.

The hierarchical regression predicting BDHI Total began with the predictor variables of sex and relationship status, which were not significant ($ps > .55$). Adding the global-instability model to the regression at Step 2 also produced non-significant results ($ps > .20$). When the domain-specific trait SE measures were entered, only mate value emerged as a marginal predictor of self-report hostility ($\beta = .33, p < .10$). The differences in amounts of variance explained between the first and second model and the second and third model were unreliable ($ps > .10$).

In the hierarchical regression for BDHI Motor, neither the group variables nor the trait global level instability measures produced any significant findings ($ps > .10$). However, when the domain-specific measures were added at Step 3, social dominance emerged as a significant predictor of motor hostility ($\beta = .25, p < .05$). Again, each subsequent model failed to reliably explain more variance than the preceding model (F change $ps > .20$).

In the hierarchical regressions on BDHI Attitude, a different pattern emerged. Once again, neither of the group variables proved to be a reliable predictor ($ps > .10$). However, in the global-instability model, trait global SE was a marginal, negative predictor of hostile attitude ($\beta = -.20, p < .10$). The introduction of the domain-specific SE model produced three significant predictors, while practically eliminating the effect of trait global SE ($p > .75$). Both superiority ($\beta = -.36, p < .01$) and social inclusion ($\beta = -.49, p < .01$) were negative predictors, whereas mate value ($\beta = .39, p < .05$) was a

positive predictor. More importantly, the Kernis model explained significantly more variance than the group variables ($\Delta R^2 = .06$, $F(2, 100) = 3.41$, $p < .05$) and the domain-specific SE model explained significantly more variance in hostile attitude than the Kernis model and group variables combined ($\Delta R^2 = .16$, $F(5, 95) = 4.00$, $p < .05$). This result demonstrated that the Kernis model can adequately predict hostile attitude on its own, but the domain-specific model effectively trumps it in its predictive ability. In other words, the domain-specific SE approach is more diagnostic in predicting hostile attitude than Kernis et al.'s (1989) global SE level and instability perspective.

Predicting Aggression in a Laboratory Experiment

Participant Attrition. Although 109 students participated in the study, several were excluded from the subsequent regressions analyses that utilized data from the experimental phase of the study. First, a pilot study was performed with 7 of the 109 participants that used slightly different materials and procedures than those outlined earlier. As a result, these seven participants were dropped. Five additional participants were dropped due to experimenter error (e.g., presenting the materials in the wrong order). Fifteen participants indicated that they didn't believe the essay feedback they received was legitimate, when asked in a face-to-face interview prior to the debriefing. Consequently, data from these 15 suspicious students were dropped from subsequent analyses. Finally, one participant repeatedly failed to appear at any of the experimental sessions, and thus, provided no data from the experimental phase of the study. This left a total of 81 participants available for all regression analyses involving trait SE inventories and measures from the experimental phase. However, only 79 participants were included

in analyses using mean state SE or TIC measures, because two of the remaining 81 did not provide any state SE measures.

Effects of Group Variables. A 2 (sex) x 2 (essay feedback) x 2 (relationship status) independent groups factorial ANOVA was performed on the transformed hot-sauce scores. (Essay feedback was coded -1 = negative feedback, 1 = positive feedback.) As expected, participants who received negative feedback ($M = 2.82$; $SE = 0.17$) allocated a significantly greater amount of hot sauce than the participants who received positive feedback ($M = 1.88$, $SE = 0.18$), $F(1, 73) = 16.74$, $p < .001$. In addition, men ($M = 2.75$, $SE = 0.18$) allocated significantly more hot sauce than women ($M = 1.95$, $SE = 0.17$), $F(1, 73) = 10.24$, $p < .01$. These results were consistent with those of Bushman and Baumeister (1998) and Kirkpatrick et al. (2001), which support the validity of the hot-sauce procedure as a measure of aggression. In addition, a marginal main effect was observed for the relationship status variable. Participants who were not involved in dating relationships at the time of the study ($M = 2.58$, $SE = 0.16$) allocated more hot sauce than those that were in relationships ($M = 2.12$, $SE = 0.19$), $F(1, 73) = 3.51$, $p < .10$. None of the interactions between these group variable effects were reliable ($ps > .20$). Since all three of these variables reliably predict hot sauce allocation, they were statistically controlled in all subsequent regression equations using transformed hot sauce weight as the dependent variable.

Self-Esteem Effects. To investigate the relationship between each SE trait variable and behavioral aggression, each trait SE scale was regressed independently on the transformed hot sauce weights, while controlling for sex, relationship status, and

essay feedback. The results of these separate regression analyses are reported in the left columns of Table 10. Of the six SE scales, only mate value reliably predicted behavioral aggression in these separate regressions ($\beta = .28, p < .01$). Next, each of these SE scales was standardized and cross-multiplied with a dummy-coded essay feedback variable (0 = negative, 1 = positive), to produce a feedback x SE scale interaction term. Each of these trait SE x feedback interactions was then regressed on to the hot sauce variable, while controlling for the effects of feedback, the respective SE scale, sex, and relationship status. The results of these separate regressions are listed in the right columns of Table 10. Not surprisingly, each of these interaction terms was negatively related to aggression. This meant that negative feedback was especially meaningful to those participants who reported higher levels of SE. In particular, people scoring high on social dominance ($\beta = -.27, p < .05$), and to a lesser extent, social inclusion ($\beta = -.24, p < .10$), allocated more hot sauce in response to the negative essay feedback.

When a parallel set of separate regressions was performed with the mean state SE variables in place of the trait SE scales, the results were similar (Table 11). In the single SE scale regressions, only mate value was a significant predictor of allocated hot sauce ($\beta = .21, p < .05$). The interaction terms for essay feedback and mean state SEs were computed in the same way they were for all trait SE measures and tested in the same fashion. In these separate analyses, mean state SE scale x feedback interactions were significant for social dominance ($\beta = -.33, p < .05$) and social inclusion ($\beta = -.41, p < .01$), and marginal for collective SE ($\beta = -.13, p < .10$). Thus, the mean state SE levels for

these three domain-specific variables were particularly associated with negative feedback when predicting hot sauce allocation.

To understand how these domain-specific SE measures predict behavioral aggression in concert, while simultaneously controlling for the three group variables and the Kernis model, hierarchical multiple regressions were performed on the hot sauce variable using trait and mean state SE measures (see Table 12). For both the trait and the mean state SE analyses, the hierarchical regression involved three steps identical to those used to predict the BDHI composites, except that essay feedback was added to the group-variables model. In other words, the group variables were entered at Step 1, followed by the Kernis model (i.e., trait global SE and its TIC) at Step 2, and ending with the domain-specific SE model at Step 3.

For the trait SE hierarchical regression on transformed hot sauce weight (see left columns of Table 12), all three group variables were significant at Step 1, as reported earlier. At Step 2, neither trait global SE nor the global TICs reliably predicted behavioral aggression ($p_s > .10$), but the group variables remained significant ($p_s < .03$). However, when the domain-specific trait SE scales were added at Step 3, mate value emerged as the sole significant predictor ($\beta = .39, p < .03$), except for the three group variables, which remained reliable ($p_s < .02$). While the Kernis model did not explain significantly more variance in the hot sauce weights than the group variables ($\Delta R^2 = .03, F(2, 73) = 1.36, p > .25$), the domain-specific SE model was marginally reliable in explaining more variance than the Kernis model and the group variables combined ($\Delta R^2 = .09, F(2, 73) = 2.00, p < .10$). This result suggested that the Kernis model was not particularly diagnostic in

predicting hot sauce weight, whereas the domain-specific SE model was arguably more diagnostic than using exclusively the group variables with global SE level and instability to predict behavioral aggression.

To demonstrate further the effectiveness of the domain-specific SE model, a parallel hierarchical regression analysis was performed on the hot sauce weights, substituting the mean state SE measures for the trait SE scales (see right columns of Table 12). After the (significant) group variables were entered at Step 1, the global-instability model was added at Step 2. Again, neither mean state global SE nor the global TICs reliably predicted hot sauce weight ($p_s > .15$), while the group variables remained significant ($p_s < .05$). When the domain-specific measures were entered at Step 3, mate value was again a significant predictor ($\beta = .39, p < .03$), as were the group variables ($p_s < .05$), and collective SE emerged as a marginal, negative predictor ($\beta = -.24, p < .06$). Once again, the Kernis model was unable to explain significantly more of the variance in hot sauce weights than the group variables ($\Delta R^2 = .02, F(3, 75) = 1.01, p > .35$). However, the domain-specific SE model was able to explain significantly more variance in behavioral aggression than the group variables and the Kernis Model combined ($\Delta R^2 = .11, F(5, 68) = 2.54, p < .05$). This result empirically demonstrated that a domain-specific SE approach was more reliable and diagnostic in predicting aggression than an approach that was limit to examining solely global SE constructs.

Discussion

The purpose of this study was to compare the global-instability SE model with the domain-specific SE model in the prediction of both self-reported hostility and behavioral

aggression in a laboratory experiment. On the whole, the domain-specific model was a more reliable and diagnostic predictor of aggression than the global-instability model. Moreover, none of the global SE constructs (including trait global SE, mean state global SE, and global SE instability) were even marginal predictors of aggression when the domain-specific SE scale were statistically controlled. Both Kernis et al. (1989) and Kirkpatrick et al. (2001) were attempting to extend SE-aggression research beyond a global-level model, albeit in different ways. The current study's findings largely confirm the inconsistent relationship between global SE and aggression, so an extension of the global SE model is certainly warranted. Simply put, global SE is an unreliable predictor of aggression.

The results of this study displayed a fairly consistent pattern of support for a domain-specific SE interpretation of hostile feelings and aggressive actions. Much of the variance within trait global SE and within global TICs was explained by several of the domain-specific measures. As a result, global SE is simply too broad of a construct to reliably predict different types of aggression in different contexts. To predict specific types of aggression (e.g., self-reported hostility, laboratory aggression) across specific situations, only a domain-specific model that gauges several types of SE can be effectively diagnostic.

First, the current study successfully replicated the findings of Kirkpatrick et al.'s (2001) first study: Several of the domain-specific SE measures reliably explained much of the variance in global SE. In the Kirkpatrick et al. study, these were mate value, superiority, social inclusion, and social dominance (albeit marginally). In the current

study, the trait SE domains predicting trait global SE were mate value, superiority and social dominance. Whether by design or by chance, these three significant SE domains collectively represent the “within-group competition” types of SE, according to Kirkpatrick and colleagues. This result was inconsistent with the findings of Leary and Cottrell (1999), who demonstrated that much of the variance in global SE could be explained by social acceptance. If this had been the case in the current study, a pattern inverse to the one observed would have resulted, with social inclusion, collective SE, or both being significant predictors of global SE.

To see whether the previous result regarding trait global SE level was generalizable to the instability of global SE, the five domain-specific SE TICs were regressed on the global SE TICs. Intriguingly, this regression produced a pattern of results inverse to those observed in the above analysis. Here, the TICs of the two “social acceptance” SE domains, social inclusion and collective SE, were the only reliable predictors of global instability (in addition to sex, in which women were more unstable than men). This result might support Leary and Cottrell’s (1999) finding concerning the relationship between social acceptance and global SE, but it occurred only in the TIC analysis and not in the trait SE analysis. Theoretically, fluctuations in SE over time should be dependent on external events. This analysis demonstrated that instability in the two “social acceptance” variables might explain most of the day-to-day instability in global SE. Furthermore, it is interesting to consider that people who feel more day-to-day variability in their social acceptance—but not in their within-group competitiveness—also feel more unstable in general.

After the preceding analyses demonstrated the independence of these SE domains in predicting global SE, the next questions were (a) whether these domain-specific SE scales would prove to be reliable predictors of self-reported hostility, (b) whether or not the current study would replicate Kernis et al.'s (1989) findings on SE instability and hostility, and (c) which of these two approaches was more powerful in explaining self-report hostility: the global-instability SE model or the domain-specific SE model. Ultimately, the global-instability model was a relatively poor predictor of self-reported aggression and the domain-specific model was a more reliable predictor, albeit far from perfect.

In the hierarchical regression analyses predicting BDHI Total and Motor from all SE variables, only mate value and social dominance, respectively, emerged as at least marginal predictors of self-reported hostility. These results implied that people who perceived themselves as either attractive to other people (particularly those of the opposite sex) or socially dominant also rated themselves as being more hostile. Contrary to what Kernis et al. (1989) had found, neither global SE instability, nor its interaction with trait SE level, were even marginal predictors of the BDHI Total and Motor composites. For BDHI Total, mate value emerged as the only marginal predictor, which was similar to the results of Kirkpatrick et al.'s (2001) second experiment in which mate value was a significant predictor of behavioral aggression. Curiously, the domain of social dominance was the sole significant predictor of BDHI Motor. This result suggested that people who perceive themselves to be socially dominant were also more likely to self-report certain forms of physical hostility. This result was comparable to the findings

of Kirkpatrick et al.'s second experiment, in which a theoretically related measure of social comparison—superiority—was a positive predictor of aggression.

For BDHI Attitude, trait global SE was a significant predictor when included in the global-instability model (replicating Kernis et al.'s 1989 marginal finding), but its effect became unreliable when the domain-specific SE variables were introduced. The three SE domains that significantly predicted BDHI Attitude were mate value (positively), superiority, and social inclusion (both negatively). The significant mate value finding mirrors the main result of Kirkpatrick et al.'s (2001) second experiment, in which mate value emerged as the sole predictor of hot sauce weight. Moreover, the significant social inclusion finding replicated the results of Kirkpatrick et al.'s first experiment, in which social inclusion was also a negative predictor of hot sauce allocation. However their first experiment also showed superiority to be a significant, positive predictor of aggression, whereas it was a significant negative predictor of hostile attitude in the current study. One possibility for this discrepancy may be the multicollinearity among some of the multiple regression variables, which sometimes cause highly related variables to behave erratically between similar analyses. However, it could also be argued that people who feel inferior harbor hostile attitudes, whereas people who feel superior actually act on those attitudes as expressed through behavioral aggression. In other words, people at both extremes of the inferiority-superiority continuum may have hostile feelings for different reasons, but only those on the high end can afford to actually act upon those feeling by displaying aggressive behavior.

The next question was whether or not these findings with self-report hostility measures could be replicated using a measure of actual aggressive behavior. On the whole, an even clearer picture emerged in the hierarchical hot sauce regressions for both trait and mean state SE scales. Most important, the domain-specific SE model was able to predict hot sauce aggression above and beyond the effects of the global-instability model and the group variables combined. In other words, the domain-specific model explained more of the variance in the hot sauce weights than all other variables collectively. This result was marginally significant for the trait SE regression and significant for the mean state SE regression. In these regression analyses, only mate value, a domain-specific construct, emerged as a significant predictor of the transformed hot sauce weights in both the trait and mean state SE analyses, in addition to the group variables.

When the results of the hierarchical regressions on self-report hostility and experimental aggression are viewed collectively, three notable patterns emerge. First, the global-instability model was only able to significantly explain more variance than the group variables in one of the five analyses. Second, the domain-specific model was more diagnostic in predicting hostility/aggression than the group variable and global-instability model combined in three of the five regression analyses (if the one marginal change statistic is included). Third, mate value was at least a marginally reliable predictor of hostility/aggression across four of the five analyses.

Why should mate value, a “within group competition” domain of SE, be reliably predictive of both self-reported hostility and behavioral aggression in a laboratory experiment? The answer may be found in an evolutionary explanation of the relationship

between mate value and aggression. The fact that mate value significantly predicted both self-report attitude hostility and behavioral aggression in two of three laboratory experiments of differing contexts (cf. Kirkpatrick et al., 2001, second experiment) suggests that it may be generalizable to many types of aggression across different contexts. It cannot be stated conclusively that people with high mate value SE were particularly insulted by the negative feedback in the experiments given that (a) no mate value level x feedback effect was observed and (b) mate value emerged to predict BDHI Attitude, when no self-esteem manipulation was attempted. Moreover, the mate value effect is unlikely to be an artifact of situational manipulation in the laboratory experiments, because this was varied between a competitive (Kirkpatrick et al., 2001, second experiment) and a noncompetitive scenario across studies.

Another possibility that must be acknowledged is that the robustness of mate value effect across different analyses may actually be an artifact of the possibility that aggression predicts mate value, rather than vice versa. Changing the causal relationship between these two variables may explain mate value's relatively high frequency as a reliable predictor of aggression across diverse contexts. If increased aggression reliably predicts higher mate value than the other SE domains, then mate value should in turn be able to predict aggression, regardless of contextual variables, when the causal direction is reversed (as it has been in all of the studies reviewed here). From an evolutionary perspective, in some primate species, males that exhibit more aggressive behavior tend to secure more mates. Having more mates may in turn lead to higher levels of self-perceived mate value. In other words, mate value may be a function of aggressive behavior, rather

than vice versa. Although the purpose of the present study was to predict aggression from SE, a model in which the causal relationship is reversed—one in which aggression predicts self-esteem—is arguably possible.

An additional perspective to account for is the fact that the study sample consisted exclusively of college undergraduates. Given that the mate value scale measures peoples' perceptions of themselves as being physically or romantically attractive to others, it should stand to reason that these types of self-feelings would be particularly salient in the minds of college undergraduates, given that many are currently “shopping” for short- or long-term mates. As a result, mate value may be of more central importance to college undergraduates at this point in their lifespan than some of the other domains. Thus, when a general insult is given (as in the current study), which specific domain it should impact becomes somewhat ambiguous, and so the insult ends up becoming associated with whichever domain is particularly salient to the individual at that point in time. However this explanation is admittedly speculative. Moreover, it doesn't explain the results of Kirkpatrick et al.'s (2000) first experiment.

If college-aged adults are in fact preoccupied with their mate value, could there be other SE domains especially salient to other populations? Perhaps social dominance is particularly important to lawyers, or perhaps older persons find social inclusion to be especially relevant to their lifestyles. To test these speculations, studies using more diverse samples are required.

Limitations of the Current Study

Perhaps the chief limitation of the current study was statistical in nature. Given that all of the SE measures were significantly intercorrelated, problems with multicollinearity may have arisen in some of the regression analyses. Such multicollinearity typically leads to large or extreme changes in the strength and direction of the predictor variables when only minimal changes are made to the overall model. However, the fact that some results were preserved between separate analyses casts some doubt on the extent to which multicollinearity might have been problematic.

The other potential problem with this study may be the validity of the self-esteem manipulation via negative feedback. As noted earlier, several participants were suspicious of the feedback they received. Not surprisingly, this was especially the case for those students who randomly received negative essay evaluations. Those who confessed their suspicions prior to the debriefing often cited the severity of the negative feedback—and the harsh hand-written comment in particular (“Weak essay. I didn’t like it.”)—as the catalyst of their suspicion. On the other hand, the fact this study liberally discarded suspicious participants from the analyses reduces the probability that any truly suspicious participants were included in the hot sauce analyses.

Directions for Future Research

One way to assess the directionality of the aggression-mate value relationship would be to perform a mediational analysis. This would involve aggression mediating the relationship between the domain-specific SE measures and mate value (i.e., domain-specific SE scales => hostility/aggression => mate value). Perhaps an even better way to

understand the direction of the aggression-mate value relationship would be to examine it on a day-to-day level using a time-lagged analysis. This would involve comparing the predictive validity of both possible directional relationships over the course of several days. For example, is a person's hostile attitude on Wednesday a consequence of their low SE on Tuesday, or is their low SE Tuesday ultimately a function of their hostile attitude on Monday? These types of analyses would likely help to settle whether aggression predicts mate value, mate value predicts aggression, or both share reciprocal causality.

Conclusions

The current study illustrated the utility of a domain-specific SE approach in predicting aggression. Not only was the domain-specific model fairly reliable on its own, but it also explained more of the variance in the hostility/aggression variable across most analyses than a global SE level and instability model explained. The results of the present study (a) replicated the findings of Bushman and Baumeister (1998), where global SE was unrelated to aggression in a laboratory setting; (b) were inconsistent with the results of Kernis et al. (1989), where global SE level, its instability, and their interaction could predict self-report hostility; and (c) replicated the findings of Kirkpatrick et al.'s (2001) second experiment, in which the domain-specific measure of mate value was a reliable predictor of laboratory aggression. A behavior as varied and important as aggression requires a highly diagnostic predictive tool to measure it. Given the results of this study, a domain-specific, rather than global, SE approach to predicting aggression is clearly warranted.

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Table 1

Descriptive Statistics for Self-Esteem and Hostility Scales

Variable	Trait Statistics		Mean State Stats		TIC Statistics	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Global Self-Esteem	3.92	.61	8.10	1.25	.46	.24
Mate Value	3.08	.71	6.27	1.95	.45	.22
Superiority	7.15	.97	7.26	1.28	.36	.23
Social Dominance	3.31	.62	6.17	1.88	.51	.23
Social Inclusion	3.96	.50	7.92	1.32	.41	.20
Collective Self-Esteem	3.81	.46	7.48	1.10	.33	.15
BDHI Total	.40	.16	—	—	—	—
BDHI Motor ^a	.45	.18	—	—	—	—
BDHI Attitude ^b	.29	.19	—	—	—	—
Hot Sauce Weight (grams)	28.38	35.47	—	—	—	—
Transformed Hot Sauce Weight	2.46	1.24	—	—	—	—

Note. BDHI = Buss-Durkee Hostility Inventory. ^aBDHI Motor averages items across the following subscales: Assault, Indirect Hostility, Verbal Hostility, and Irritability. ^bBDHI Attitude averages items across the Resentment and Suspicion subscales. TIC = Transformed Instability Coefficient. Hot sauce weights were transformed by taking the natural log of the weight in grams plus one. For all trait statistics, N = 109; for state and TIC statistics, N = 105; for weight statistics, N = 108.

Table 2

Correlations Among Trait Self-Esteem Level Measures

Self-Esteem Scale	1	2	3	4	5	6
1. Global Self-Esteem	(.87)					
2. Mate Value	.68	(.90)				
3. Superiority	.63	.53	(.71)			
4. Social Dominance	.59	.50	.45	(.85)		
5. Social Inclusion	.55	.73	.44	.40	(.90)	
6. Collective Self-Esteem	.35	.36	.28	.30	.60	(.86)

Note. Reliability coefficients appear on the diagonal. $N = 109$. All $ps < .01$.

Table 3

Correlations Among Mean State Self-Esteem Measures

Self-Esteem Scale	1	2	3	4	5	6	Validity
1. Global Self-Esteem	(.95)						.79
2. Mate Value	.62	(.98)					.89
3. Superiority	.60	.68	(.97)				.77
4. Social Dominance	.46	.45	.65	(.97)			.60
5. Social Inclusion	.69	.75	.58	.34	(.97)		.83
6. Collective Self-Esteem	.51	.38	.35	.31	.61	(.98)	.79

Note. Reliability coefficients appear on the diagonal. Validity coefficients are correlations between each SE scale's mean state measure and its respective trait measure. (Procedures for calculating the reliability and validity of such measures are described in Bryk & Raudenbush, 1992, pp. 43-44 and p. 65, respectively.) $N = 105$. All $ps < .01$.

Table 4

Correlations Among Self-Esteem Transformed Instability Coefficients

Self-Esteem Scale	1	2	3	4	5
1. Global Self-Esteem					
2. Mate Value	.60				
3. Superiority	.44	.43			
4. Social Dominance	.41	.35	.36		
5. Social Inclusion	.67	.68	.43	.37	
6. Collective Self-Esteem	.68	.54	.32	.41	.62

Note. N = 105. All *ps* < .01.

Table 5

Correlations Between Trait Self-Esteem Measures and Self-Esteem Transformed
Instability Coefficients

Trait Self-Esteem Scale	Transformed Instability Coefficients (TICs)					
	1	2	3	4	5	6
1. Global Self-Esteem	-.35**	-.13	-.25**	-.10	-.16	-.01
2. Mate Value	-.21*	-.12	-.20**	-.15	-.20*	-.06
3. Superiority	-.21*	-.02	-.32**	-.12	-.16	-.08
4. Social Dominance	-.13	-.10	-.26**	-.05	-.10	-.03
5. Social Inclusion	-.13	-.01	-.08	.07	-.16	.03
6. Collective Self-Esteem	-.08	.04	-.05	.12	-.01	.00

Note. $N = 105$.

* $p < .05$

** $p < .01$

Table 6

Correlations Between Dependent Measures of Hostility and Aggression

Dependent Variable	1	2	3
1. BDHI Total	(.89)		
2. BDHI Motor ^a	.95**	(.87)	
3. BDHI Attitude ^b	.75**	.54**	(.76)
4. Transformed Hot Sauce Weight	.06	.06	.03

Note. BDHI = Buss-Durkee Hostility Inventory. ^aBDHI Motor averages items across the following subscales: Assault, Indirect Hostility, Verbal Hostility, and Irritability. ^bBDHI Attitude averages items across the Resentment and Suspicion subscales. Reliability coefficients appear on the diagonal for the BDHI measures. Ns = 109 for BDHI measures and 108 for hot sauce measures.

** $p < .01$

Table 7

Predicting Trait Global Self-Esteem (SE) from Trait Domain-Specific SE (Right Columns) and Predicting Global SE Transformed Instability Coefficients (TICs) from Domain-Specific SE TICs (Left Columns)

Variables	Trait Global Self-Esteem			Global Self-Esteem TICs		
	<u>B</u>	<u>SE_B</u>	β	<u>B</u>	<u>SE_B</u>	β
Sex	.06	.04	.10	-.03	.02	-.14*
Relationship Status	.05	.04	.07	-.01	.02	-.06
Mate Value	.23	.10	.27*	.15	.10	.14
Superiority	.17	.05	.28***	.09	.08	.09
Social Dominance	.23	.07	.23**	.03	.08	.03
Social Inclusion	.13	.14	.11	.32	.12	.28**
Collective Self-Esteem	.07	.10	.05	.60	.13	.38***

Note. TIC = Transformed Instability Coefficient. Each set of three columns represents a separate multiple regression analysis. For the left three columns, trait global SE was regressed on the trait domain-specific SE measures ($N = 109$). For the right three columns, global SE TICs were regressed on the domain-specific SE TICs ($N = 105$).

* $p < .05$

** $p < .01$

*** $p < .001$

Table 8

Correlations Between Self-Esteem Scales, Hostility Measures, and Transformed Hot Sauce Weights

Trait Self-Esteem Scale	Buss-Durkee Hostility Inventory			
	Total	Motor ^a	Attitude ^b	Hot Sauce
Global Self-Esteem TIC	.14	.07	.19*	-.01
Global Self-Esteem	-.13	-.04	-.29**	.11
Mate Value	.00	-.08	-.20*	.13
Superiority	-.11	-.03	-.41**	.07
Social Dominance	.04	.15	-.20*	.15
Social Inclusion	-.18	-.08	-.34**	.04
Collective Self-Esteem	-.17	-.13	-.18	.00

Note. ^aBDHI Motor averages items across the following subscales: Assault, Indirect Hostility, Verbal Hostility, and Irritability. ^bBDHI Attitude averages items across the Resentment and Suspicion subscales. TIC = Transformed Instability Coefficient. For BDHI correlations, $N = 109$, except for Global SE TIC correlations, where $N = 105$. For Hot sauce correlations, $N = 108$, except for Global SE TIC correlations, where $N = 104$.

* $p < .05$

** $p < .01$

Table 9

Regressions Predicting Hostility Scales

Variables	BDHI Total			BDHI Motor ^a			BDHI Attitude ^b		
	<u>B</u>	<u>SE_B</u>	β	<u>B</u>	<u>SE_B</u>	β	<u>B</u>	<u>SE_B</u>	β
Sex	.00	.02	.01	.01	.02	.06	-.01	.02	-.04
Relationship Status	.00	.02	-.01	.01	.02	.06	-.03	.02	-.13
Global SE TIC	.08	.07	.11	.04	.08	.06	.11	.08	.13
Global Self-Esteem	-.04	.04	-.15	-.07	.05	-.24	.01	.05	.04
Mate Value	.08	.04	.33 ⁺	.05	.05	.21	.11	.05	.39 [*]
Superiority	-.02	.04	-.09	.01	.03	.03	-.07	.02	-.36 ^{**}
Social Dominance	.04	.03	.16	.07	.04	.25 [*]	-.01	.04	-.03
Social Inclusion	-.10	.06	-.30	-.05	.07	-.15	-.19	.06	-.49 ^{**}
Collective SE	-.02	.04	-.07	-.04	.05	-.11	.04	.05	.09

Note. BDHI = Buss-Durkee Hostility Inventory. ^aBDHI Motor averages items across the following subscales: Assault, Indirect Hostility, Verbal Hostility, and Irritability. ^bBDHI Attitude averages items across the Resentment and Suspicion subscales. TIC = Transformed Instability Coefficient. Each set of three columns represents the final step of three separate hierarchical regression analyses. The dependent variables for the left, middle, and right sets of columns were BDHI Total, Motor, and Attitude, respectively (Ns = 105).

⁺ $p < .10$

^{*} $p < .05$

^{**} $p < .01$

Table 10

Results of Separate Regressions of Trait Self-Esteem on Transformed Hot Sauce Weights

Self-Esteem Scale	Trait Self-Esteem			Trait SE x Feedback		
	<u>B</u>	<u>SE_B</u>	β	<u>B</u>	<u>SE_B</u>	β
Global Self-Esteem	.08	.21	.04	-.18	.24	-.11
Mate Value	.50	.18	.28**	-.31	.24	-.16
Superiority	.03	.14	.02	-.10	.26	-.05
Social Dominance	.21	.19	.11	-.48	.24	-.27*
Social Inclusion	.44	.26	.16	-.48	.26	-.24 ⁺
Collective Self-Esteem	.15	.28	.05	-.37	.26	-.18

Note. Each row represents a separate regression analysis. Trait Self-Esteem (columns 1-3) is test of the respective self-esteem scale in regression equation with effects of sex, feedback, and relationship status controlled. Trait SE x Feedback (columns 4-6) is test of interaction effect when added to preceding equation. N = 81.

⁺p < .10

*p < .05

**p < .01

Table 11

Results of Separate Regressions of Mean State Self-Esteem on Transformed Hot SauceWeights

Self-Esteem Scale	State Self-Esteem			State SE x Feedback		
	<u>B</u>	<u>SE_B</u>	β	<u>B</u>	<u>SE_B</u>	β
Global Self-Esteem	-.02	.10	-.02	-.36	.26	-.21
Mate Value	.13	.06	.21*	-.39	.24	-.20
Superiority	.13	.11	.13	-.35	.25	-.19
Social Dominance	.00	.07	.01	-.62	.25	-.33*
Social Inclusion	.05	.09	.06	-.65	.24	-.41**
Collective Self-Esteem	-.14	.11	-.13	-.42	.24	-.24 ⁺

Note. Each row represents a separate regression analysis. State Self-Esteem (columns 1-3) is test of the respective self-esteem scale in regression equation with effects of sex, feedback, and relationship status controlled. State SE x Feedback (columns 4-6) is test of interaction effect when added to preceding equation. N = 79.

⁺ $p < .10$

* $p < .05$

** $p < .01$

Table 12

Regressions Predicting Transformed Hot Sauce Weights

Variables	Trait Self-Esteem Scales			Mean State SE Scales		
	<u>B</u>	<u>SE_B</u>	β	<u>B</u>	<u>SE_B</u>	β
Sex	.36	.14	.29*	.30	.14	.24*
Relationship Status	-.34	.13	-.27*	-.33	.13	-.26*
Essay Feedback	-.54	.12	-.44**	-.59	.12	-.48**
Global SE TIC	.74	.51	.15	.76	.60	.15
Global Self-Esteem	-.40	.33	-.20	-.02	.17	-.03
Mate Value	.69	.31	.39*	.24	.10	.39*
Superiority	-.01	.17	-.01	.08	.19	.07
Social Dominance	.21	.23	.11	-.05	.09	-.08
Social Inclusion	.06	.45	.02	-.02	.18	-.02
Collective SE	-.12	.33	-.04	-.27	.14	-.24 ⁺

Note. TIC = Transformed Instability Coefficient. Each set of three columns represents the final step of a hierarchical regression analysis. The independent variables of sex, relationship status, essay feedback, and global SE TIC were controlled across both analyses. The predictor variables for the left three columns were the trait SE scales (N = 81). The predictor variables for the right three columns were the mean state SE scales (N = 79).

⁺p < .10

*p < .05

**p < .01

Appendix A

Information Session Handout

Directions and Schedule for Greg Webster's Study of Personality

1. Log onto any computer with Internet access and select you favorite web browser.
2. Enter the address "staff.wm.edu/espn/greg" or "http://staff.wm.edu/espn/greg"
3. Follow all the directions on the website. Read them carefully.
 - a. If it is your first time to the website, you must select "Register."
 - b. For all your subsequent visits to the site, simply select Part I, II, or III.
4. Use your six-letter W&M e-mail username (e.g., "gdwebs") as your Login ID.
5. Enter a password of your choosing and be sure to remember it for other sessions.
6. Complete Part I anytime on Sunday, November 12, 2000.
7. Complete Part II eight (8) times using the schedule below:

<u>Schedule</u>	Monday	Tuesday	Wednesday	Thursday	Friday
10 a.m. (+/- 2 hrs.)		2	4	6	8
10 p.m. (+/- 2 hrs.)	1	3	5	7	(make-up)

8. After completing Part II for the eighth and final time, complete Part III.
9. You will be contacted and scheduled for the attitudes and taste preferences studies soon.

If you have any questions, comments, computing concerns, or scheduling emergencies, please notify me immediately by e-mail: gdwebs@wm.edu or phone: x13677. Thank you and good luck.

Appendix B

Rosenberg's (1965) Global Self-Esteem Scale

1. I feel that I am a person of worth, at least on an equal basis with others.*
2. I feel that I have a number of good qualities.*
3. All in all, I am inclined to feel that I am a failure.*
4. I am able to do things as well as most other people.*
5. I feel I do not have much to be proud of.*
6. I take a positive attitude toward myself.*
7. On the whole, I am satisfied with myself.*
8. I wish I could have more respect for myself.*
9. I certainly feel useless at times.*
10. At times I think I am no good at all.*

Appendix C

Inclusionary Status Scale (Spivey, 1990)

1. I sometimes think that other people avoid interacting with me.*
2. I can't rely on my friends or family in times of need.
3. People often seek out my company.
4. If I want to socialize with my friends, I am generally the one who must seek them out.
5. I am fortunate to have many caring and supportive friends.
6. Others shun me.
7. I think there are many people who like to be with me.*
8. I often feel like an outsider in social gatherings.*
9. I feel welcome in most social situations.*

Appendix D

Interpersonal Support Evaluation List (Cohen et al.,1985)

1. If I decide on a Friday afternoon that I would like to go to a movie that evening, I could find someone to go with me.*
2. No one I know would throw a birthday party for me.
3. There are several different people with whom I enjoy spending time.
4. If I wanted to have lunch with someone, I could easily find someone to join me.*
5. I don't often get invited to do things with others.*
6. Most people I know don't enjoy the same things that I do.
7. When I feel lonely, there are several people I could call and talk to.*
8. I regularly meet or talk with members of my family or friends.
9. I feel that I'm in the fringe in my circle of friends.
10. If I wanted to go out of town for the day, I would have a hard time finding someone to go with me.

Appendix E

Self-Attributes Questionnaire (Pelham & Swann, 1989)

This questionnaire has to do with your attitudes about some of your activities and abilities. For the first ten items below, you should rate yourself relative to other college students your own age (and sex) by using the following scale:

A	B	C	D	E	F	G	H	I	J
bottom	lower	lower	lower	lower	upper	upper	upper	upper	top
5%	10%	20%	30%	50%	50%	30%	20%	10%	5%

An example of the way the scale works is as follows: if one of the traits that follows were “height”, a woman who is just below average in height would choose “E” for this question, whereas a woman who is taller than the 80% (but not taller than 90%) of her female classmates would mark “H”, indicating that she is in the top 20% on this dimension.

1. intellectual/academic ability
2. social skills/social competency*
3. artistic and/or musical ability
4. athletic ability
5. physical attractiveness*
6. leadership ability*
7. common sense*
8. emotional stability
9. sense of humor
10. discipline

Appendix F

Social Dominance (Leary & Cottrell, 1999; Megargee, 1972)

1. I doubt whether I would make a good leader.
2. When I work on a committee I like to take charge of things.*
3. I must admit that I try to see what others think before I take a stand.
4. I would be willing to describe myself as a pretty “strong” personality.
5. There are times when I act like a coward.
6. I would rather not have very much responsibility for other people.
7. It is pretty easy for people to win arguments with me.
8. I have a natural talent for influencing people.
9. I like to give orders and get things moving.*
10. People seem naturally to turn to me when decisions have to be made.*
11. Taking charge comes easily to me.*

Appendix G

Mate Value (Williams, 1998, 1999)

1. I sometimes wish I were more physically attractive.
2. Members of the opposite sex seem to like me.
3. I feel as if no one of the opposite sex is “out of my league”.
4. It surprises me when someone of the opposite sex shows interest in me.*
5. I feel that the chances that I would date one of the most popular persons of the opposite sex on campus are very good.*
6. In a social situation, I often find that persons of the opposite sex seem to act as if I’m not even there.*
7. I find that, after I go out on a date with someone of the opposite sex, that person wants to go out with me on a second date.
8. I do not find it easy to meet people of the opposite sex.
9. I often get compliments from people of the opposite sex, even when I don’t think that I look especially good.
10. I do not regularly “date” or “see” people of the opposite sex.
11. When I start a conversation with someone of the opposite sex whom I do not know, that person usually seems eager to talk to me.*
12. I often worry about what people of the opposite sex think about me.

Appendix H

Collective Self-Esteem (Luhtanen & Crocker, 1992)

1. I am a worthy member of the social groups I belong to.*
2. I often regret that I belong to some of the social groups I do.*
3. Overall, my social groups are considered good by others.*
4. Overall, my group memberships have very little to do with how I feel about myself.*
5. I feel I don't have much to offer to the social groups I belong to.*
6. In general, I'm glad to be a member of the social groups I belong to.*
7. Most people consider my social groups, on average, to be more ineffective than other social groups.*
8. The social groups I belong to are an important reflection of who I am.*
9. I am a cooperative participant in the social groups I belong to.*
10. Overall, I often feel that the social groups of which I am a member are not worthwhile.*
11. In general, others respect the social groups that I am a member of.*
12. The social groups I belong to are unimportant to my sense of what kind of a person I am.*
13. I often feel I'm a useless member of my social groups.*
14. I feel good about the social groups I belong to.*
15. In general, others think that the social groups I am a member of are unworthy.*
16. In general, belonging to social groups is an important part of my self-image.*

Appendix I

Buss-Durkee Hostility Inventory: Assault Subscale (Buss & Durkee, 1957)

1. Once in a while I cannot control my urge to harm others.
2. I can think of no good reason for ever hitting anyone.
3. If somebody hits me first, I let them have it.
4. Whoever insults me or my family is asking for a fight.
5. People who continually pester you are asking for a punch in the nose.
6. I seldom strike back, even if someone hits me first.
7. When I really lose my temper, I am capable of slapping someone.
8. I get into fights about as often as the next person.
9. If I have to resort to physical violence to defend my rights, I will.
10. I have known people who pushed me so far that we came to blows.

Appendix J

Buss-Durkee Hostility Inventory: Indirect Hostility Subscale (Buss & Durkee, 1957)

1. I sometimes spread gossip about people I don't like.
2. I never get mad enough to throw things.
3. When I am mad, I sometimes slam doors.
4. I never play practical jokes.
5. When I am angry, I sometimes sulk.
6. I sometimes pout when I don't get my own way.
7. Since the age of ten, I have never had a temper tantrum.
8. I can remember feeling so angry that I picked up the nearest thing and broke it.
9. I sometimes show my anger by banging on the table.

Appendix K

Buss-Durkee Hostility Inventory: Irritability Subscale (Buss & Durkee, 1957)

1. I lose my temper easily but get over it quickly.
2. I am always patient with others.
3. I am irritated a great deal more than people are aware of.
4. It makes my blood boil to have somebody make fun of me.
5. If someone doesn't treat me right, I don't let it annoy me.
6. Sometimes people bother me just by being around.
7. I often feel like a powder keg ready to explode.
8. I sometimes carry a chip on my shoulder.
9. I can't help being a little rude to people I don't like.
10. I don't let a lot of unimportant things irritate me.
11. Lately, I have been kind of grouchy.

Appendix L

Buss-Durkee Hostility Inventory: Negativity Subscale (Buss & Durkee, 1957)

1. Unless somebody asks me in a nice way, I won't do what they want.
2. When somebody makes a rule I don't like, I am tempted to break it.
3. When someone is bossy, I do the opposite of what they ask.
4. When people are bossy, I take my time just to show them.
5. Occasionally, when I am mad at someone, I will give them the 'silent treatment.'

Appendix M

Buss-Durkee Hostility Inventory: Resentment Subscale (Buss & Durkee, 1957)

1. I don't seem to get what's coming to me.
2. Other people always seem to get the breaks.
3. When I look back on what's happened to me, I can't help feeling mildly resentful.
4. Almost every week I see someone I dislike.
5. Although I don't show it, I am sometimes eaten up with jealousy.
6. I don't know any people that I downright hate.
7. If I let people see the way I feel, I'd be considered a hard person to get along with.
8. At times, I feel I get a raw deal out of life.

Appendix N

Buss-Durkee Hostility Inventory: Suspicion Subscale (Buss & Durkee, 1957)

1. I know that people tend to talk about me behind my back.
2. I tend to be on my guard with people who are somewhat more friendly than I expected.
3. There are a number of people who seem to dislike me very much.
4. There are a number of people who seem to be jealous of me.
5. I sometimes have the feeling that others are laughing at me.
6. My motto is, 'Never trust strangers.'
7. I commonly wonder what hidden reason another person may have for doing something nice for me.
8. I used to think that most people told the truth, but now I know otherwise.
9. I have no enemies who really wish to harm me.
10. I seldom feel that people are trying to anger or insult me.

Appendix O

Buss-Durkee Hostility Inventory: Verbal Hostility Subscale (Buss & Durkee, 1957)

1. When I disapprove of my friends' behavior I let them know it.
2. I often find myself disagreeing with people.
3. I can't help getting into arguments when people disagree with me.
4. I demand that people respect my rights.
5. Even when my anger is aroused, I don't use 'strong language.'
6. If somebody annoys me, I am apt to tell them what I think of them.
7. When people yell at me, I yell back.
8. When I get mad, I say nasty things.
9. I could not put someone in their place, even if they needed it.
10. I often make threats I don't really mean to carry out.
11. When arguing, I tend to raise my voice.
12. I generally cover up my poor opinion of others.
13. I would rather concede a point than get into an argument about it.

Appendix P

Script for Hot Sauce Experimenter

When participant (P) arrives, escort them to a cubicle. Give them the “Self Attitudes Study” sheet and ask them to begin writing.

Return in 7 Minutes

Ask P if they’re done with their essay. If not, tell them to wrap it up. Tell P that, to save you, the experimenter, time, you’re going to randomly assign P to be paired with another P in the room and that you’re going to have them evaluate each other’s essays. Collect “Self Attitudes Study.”

Return in 1 Minute

Give P blank ESSAY EVALUATION SCALE and sex-specific BOGUS ESSAY. Ask P to rate his/her [always allude to a same-sex partner] essay using the scales. Return in 3 minutes.

Collect completed ESSAY EVALUATION SCALE and sex-specific BOGUS ESSAY. Tell P that, because some people may be interested in improving their writing skills, they will get to see how their partner evaluated their essay. Tell P that you’re going to trade their essay evaluations with each other now.

Return in 1 Minute

Give P a folded BOGUS ESSAY EVALUATION SCALE. Tell them the food preferences study will begin shortly.

Return in 1 Minute

Give P blank TASTE PREFERENCE INVENTORY and ask them to complete it.

Return in 1 Minute

Collect completed TASTE PREFERENCE INVENTORY.

In a tentative manner, say, “Let’s see...today’s [day of week], so we’ll be tasting...um...dry and spicy foods today—so say ‘dry’ or ‘spicy.’ Okay, you’ve randomly selected yourself to be preparing a sample of spicy food for your partner, whereas he/she will be preparing a dry food sample for you to taste.”

Tell P you're going to trade TASTE PREFERENCE INVENTORIES with their partner and have each of them prepare a food sample for each other in order to save you, the experimenter, the time of having to do it yourself.

Return in 3 Minutes

Place a single saltine cracker in an envelope marked with your P's ID# (e.g., F24, M36, etc.) and give it to P along with the FOOD EVALUATION SCALE. Tell P that you, the experimenter, are supposed to be blind to the type and quantity of cracker his/her partner has chosen, and that this is why it's in an envelope. Tell P that they should consume the entire amount of food that's in the envelope.

Collect BOGUS ESSAY EVALUATION SCALES.

Return as soon as you are able to prepare the following:

BOGUS TASTE PREFERENCE INVENTORY

HOT SAUCE ALLOCATION CHECKLIST

Large container of hot sauce

Empty Styrofoam cup with lid

Plastic cup filled with some water

Big spoon for transferring hot sauce

Little spoon for taste-testing hot sauce

Tray upon which to carry everything

Tell P that any sample amount of hot sauce is useful and that they should prepare as much or as little as they want, keeping in mind that their partner will be asked to consume the entire amount with some nacho chips, just as they were asked to consume the entire cracker that was given to them in the envelope. Tell P to place their partner's number on the cup so that we don't get it mixed up with other peoples' sample. Walk participant through the steps on the HOT SAUCE ALLOCATION CHECKLIST.

Return in 3 Minutes

Collect EVERYTHING on the tray.

Return in 1 Minute

Ask P if they thought that the essay evaluation they received came from their partner in one of the other cubicles. Make note of their answer.

Give P the written DEBRIEFING. Tell P that when they are done, they may leave. Make sure they know that they are free to ask any questions or voice any concerns regarding the experiment on their way out.

Appendix Q

Essay Form with Bogus Essay

Please write your six-letter W&M e-mail user name here: _____

Please note your participant number for the Attitude and Taste Preferences Studies: _____

Self Attitudes Study

Using the space below, please write a brief, one-paragraph essay on what you would like to be doing with your life five years from now. Please take no more than about seven or eight minutes. When you are finished, please open your door slightly to let us know that you have finished your essay.

“Although I’m really not sure exactly what I’d like to be doing five years from now, I can see myself beginning graduate school in some area. I don’t even know what I’m going to major in here, so it’s hard to say exactly what I might be doing in graduate school. What I do know is that I’d like to continue my education beyond college, even if it means taking one or two years off to work and save up money for graduate school. If I should end up working five years from now, I think I’d like to have a job where I don’t have to sit behind a desk all day.”

Appendix R

Essay Evaluation Scale

ESSAY EVALUATION SCALE

Please rate the other participant's essay using the scales found below. Subject No. _____

1.	Organization	-3.....-2.....-1.....0.....1.....2.....3	Poor	Excellent
2.	Content	-3.....-2.....-1.....0.....1.....2.....3	Poor	Excellent
3.	Writing Style	-3.....-2.....-1.....0.....1.....2.....3	Poor	Excellent
4.	Clarity of Expression	-3.....-2.....-1.....0.....1.....2.....3	Poor	Excellent
5.	Thoughtfulness	-3.....-2.....-1.....0.....1.....2.....3	Poor	Excellent
6.	Overall Quality	-3.....-2.....-1.....0.....1.....2.....3	Poor	Excellent

Additional Comments:

Appendix T

Food Evaluation Scale

FOOD EVALUATION SCALE

Please rate the food that you just tasted on the scales below.

Subject No. _____

- | | | |
|----|----------------------|--------------------------------------------------------------------|
| 1. | Appearance | 1.....2.....3.....4.....5.....6.....7.....8.....9 |
| | | Complete Dislike Extreme Liking |
| 2. | Aroma | 1.....2.....3.....4.....5.....6.....7.....8.....9 |
| | | Complete Dislike Extreme Liking |
| 3. | Taste | 1.....2.....3.....4.....5.....6.....7.....8.....9 |
| | | Complete Dislike Extreme Liking |
| 4. | Texture | 1.....2.....3.....4.....5.....6.....7.....8.....9 |
| | | Complete Dislike Extreme Liking |
| 5. | Overall Satisfaction | 1.....2.....3.....4.....5.....6.....7.....8.....9 |
| | | Complete Dislike Extreme Liking |

Appendix U

Hot Sauce Allocation Checklist

HOT SAUCE ALLOCATION CHECKLIST

Please check off each step as you complete it.

Subject No. _____

1. Taste a sample of the hot sauce. _____
2. Place hot sauce in Styrofoam cup using plastic spoon _____
3. Place lid firmly on top of Styrofoam cup. _____
4. Write subject number of person receiving hot sauce on cup. _____

How many spoonfuls of hot sauce did you allocate? _____

Please remember to place this form in the envelope provided in order to maintain anonymity.

Appendix V

Debriefing

DEBRIEFING

You have now completed the study of Personality, Attitudes, and Taste Preferences. The actual purpose of our study is to observe the relationship between different types of self-esteem and aggression. Traditionally, researchers have thought there is a relationship between low self-esteem and aggression. More recently, there have been some studies that have shown a different relationship between these two variables. At times even contradictory effects have been found between self-esteem and aggression, especially certain subtypes of self-esteem like narcissism. We want to investigate how different types of self-esteem are related to aggression under different circumstances.

The on-line “personality” part of the study entailed the measurement self-esteem in several different ways. First, we measured self-esteem level. Next we measured self-esteem over the course of a week to assess its variability. Finally we obtained self-report measures of aggression. You might have noticed that most of these questions concerned how you feel about yourself in one way or another.

The “attitudes” and “taste preferences” parts of the study were designed to provoke an aggressive reaction. In this section, we used some deception tactics to better observe your reactions to this particular circumstance. This deception involved making you believe someone was actually evaluating your essay, when in fact you were randomly assigned to receive either a good or bad evaluation. The essay you were asked to evaluate was also a part of this bogus information. That essay you read, the evaluation you received, and your fictional partner’s taste preference inventory were all pre-written by us, and no one actually evaluated your writing. Also, everyone was led to believe they were preparing a hot-sauce sample, which no one actually ate. Although we’re not sure, we think that people who received positive evaluations will allocate less hot sauce to their fictional partner than those who received negative feedback. We’re also unsure about whether or not hot sauce amounts are related to aggression, since people’s tastes vary.

We sincerely appreciate your time and commitment to this effort. We apologize for having deceived you (or at least trying to), but hopefully now you understand why this deception was necessary. Because of the deceptive nature of this study, we ask that you not describe these aspects of this study with anyone until the end of the semester.

Please return this sheet to one of the experimenters on your way out. Thank you!

VITA

Gregory Daniel Webster

The Author was born on January 4th, 1976, in Woodstock, New York. He graduated from Holland Hall School in Tulsa, Oklahoma in 1994. In 1997, he graduated cum laude and Phi Beta Kappa from The Colorado College in Colorado Springs, Colorado. In August of 2001, he will earn his master of arts in general psychology from The College of William and Mary in Williamsburg, Virginia. The author will attend the University of Colorado at Boulder, where he will pursue a doctoral degree in social psychology.