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THE IMPACT OF AMBIGUOUS VERSUS BLATANT RACE RELATED STRESS
ON EGO DEPLETION IN AFRICAN AMERICAN ADULTS

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at Virginia Commonwealth University

by

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Abstract

THE IMPACT OF AMBIGUOUS VERSUS BLATANT RACE RELATED STRESS ON EGO DEPLETION IN AFRICAN AMERICAN ADULTS

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The aim of the current study was to examine variations in the impact of ambiguous versus blatant race related stressors on ego depletion in a sample of African American adults. Blatant race related stress was compared with ambiguous race related stress in regards to the relative impact on the constructs of ego depletion and perseverative cognition. Perseverative cognition was also examined as a potential mediating variable in the relationship between race related stress and ego depletion. Additionally, attributional

ambiguity was hypothesized to moderate the effect of race related stress on perseverative cognition. The study implemented an experimental design, and assessed the integrity of the proposed moderated mediator model in a sample of 159 African American undergraduate students using MANCOVA and hierarchical multiple regression. Analyses failed to detect significant differences in ambiguous versus blatant race related stressors on perseverative cognition or ego depletion, and did not support the proposed model. Limitations of the study and implications for future research are discussed.

The Impact of Ambiguous versus Blatant Race Related Stress on Ego Depletion in African American Adults

Over the past decade, there has been extensive research on the impact of race related stress on the physical and psychological health and well-being of African Americans. Race related stress refers to stressors experienced as a consequence of belonging to, and identifying with, a racial or ethnic minority group, and may take many forms (Harrell, 2000). Race related stress may result from perceived individual, institutional, or cultural racism or discrimination (Jones, 1997), and may significantly impact the well-being and quality of life of African Americans (Brown et al. 2000; Clark, Anderson, Clark, & Williams, 1999; Harrell, 2000; Outlaw, 1993; Sanders-Thompson, 2002; Utsey, 1999; Utsey & Payne, 2000).

Racism in America is based on a belief in the inherent superiority of the dominant group (i.e. White Americans), and is reinforced and maintained by the dominant group's power to determine outcomes for other (presumably inferior) groups (Jones, 1997). Thus, privileges and advantages are granted to members of the dominant group, and non-dominant group members are systematically excluded from equal access to societal resources and esteem (Harrell, 2000). Racism is rooted in historical racial oppression, and implies a biological (rather than social) concept of race. Jones (1997) identifies three types of racism: individual, institutional, and cultural. As the name implies, individual racism refers to an individual's belief in the superiority of his or her own racial group, and the resulting racial prejudice and discrimination that individual directs toward non-group members. Institutional racism is the often entrenched and widespread, extension of individual racism to societal institutions (e.g. education, health care, housing) intended to maintain the power and privilege of the dominant group, and reinforce the perceived inferiority of non-dominant groups. Cultural racism involves the dominant group's

ability to define the cultural beliefs, values, and practices that are deemed valid and acceptable and to ignore, marginalize, or otherwise punish, cultural ideals or practices that diverge from the dominant culture (Jones, 1997). Cultural racism is also described as the individual and institutional expression of the belief that the dominant culture is superior to that of non-dominant groups (Utsey, 1999). Examples of cultural racism toward African Americans include the negative stereotypical portrayals of African Americans in various mass media outlets, as well as the absence of positive images and contributions of Africans and African Americans in many elementary and high school history texts (Oliver, 2001).

Although racism and race related stress may be experienced by members of any ethnic minority group, research suggests that African Americans report more frequent negative race related experiences than members of other minority groups, specifically Asians and Latinos (Utsey, 1999). One survey of 153 African American men and women between the ages of 15 and 70 revealed that 98.1% of the sample had experienced some form of race related stress in the previous year (Landrine & Klonoff, 1996). One hundred percent of this sample had experienced negative race related encounters at some point of their lives, and 99.4% of the participants indicated that such race related events were stressful (Landrine & Klonoff, 1996).

Although there is a substantial literature on the psychological and physiological effects of race related stress on African Americans, the majority of the literature has tended to focus on overt race related stressors. While blatant forms of racism and race related stress have historically been easily discernable (e.g., racial slurs, racially motivated violence, Jim Crowism), ambiguous race related stressors remain prevalent, insidious, and, arguably, more detrimental to the overall well-being of African Americans (Bennett, Merritt, Edwards, & Sollers, 2004; Torres & Driscoll, 2010). There is increasing evidence that ambiguous race related encounters may be

the most damaging type of race related stimuli (Bennett et al., 2004; Case, 1995; Guyll, Matthews, & Bromberger, 2001; Salvatore & Shelton, 2007). For instance, race related microaggressions are a form of ambiguous race related stress that encompass a wide array of subtle insults, covert slights, disparaging messages, and other insidious, noxious race related stimuli that commonly occur on a consistent basis (Pierce, 1970; Solorzano, Ceja, & Yosso, 2000; Sue, Capodilupo et al., 2007; Torres & Driscoll, 2010).

Race related microaggressions are subtle in nature and may easily go unnoticed by outside observers, and even by perpetrators of the offense, but are often felt as insulting, demeaning, and/or degrading by the individual experiencing them. Microaggressions are generally related to the awareness that one is a member of a stigmatized racial group, coupled with environmental cues that suggest that the individual has been marginalized, devalued, slighted, stereotyped, or otherwise unfairly judged based on racial group membership. Such subtle stressors are associated with attributional ambiguity, a term used to describe an individual's sense of uncertainty about whether an encounter or event he or she has experienced is related to racial group membership or to other unrelated factors (Crocker & Major, 1989; Crocker, Voelkl, Testa, & Major, 1991; Inzlicht, McKay, & Aronson, 2006; Sue et al., 2007; Torres & Driscoll, 2010). This uncertainty about the motives for others' behaviors and reactions toward them has a significant impact on the psychological well-being of African Americans following interracial encounters (Crocker & Major, 1989; Crocker et al., 1991; Mendes, Major, McCoy, & Blascovich, 2008; Hoyt, Aguilar, Kaiser, Blascovich, & Lee, 2007). Research has indicated that this type of chronic ambiguous race related stress results in a variety of negative outcomes (Inzlicht et al., 2006). One such negative outcome related to exposure to ambiguous race related stress is a reduced capacity to engage in effective self-regulatory and self-control

behaviors (Bennett et al., 2004; Inzlicht et al, 2006; Inzlicht & Kang, 2010; Salvatore & Shelton, 2007). This impairment in domains related to self-control is known as ego depletion.

Ego depletion is a psychological construct based on the strength model of self-control, which views self-control as an expendable energy resource that may be depleted during tasks that require deliberate, effortful volition (Baumeister, Bratslavsky, Muraven, & Tice, 1998).

According to this model, engaging in an act that requires self-control results in diminished capacity to exert subsequent acts of self control (Baumeister et al., 1998; Hagger, Wood, Stiff, & Chatzisarantis, 2010). This diminished self-control capacity is defined as ego depletion, and has been linked to impairment in an array of tasks that require the exertion of self-control such as attention, persistence, emotion regulation, and decision making (Hagger et al., 2010). Some have referred to ego depletion, and the associated failure of self-control, as one of the most significant problems in modern society, as it plays a key role in social issues including depression, substance use, aggression, and violence (Baumeister 2003; Baumeister et al., 1994; Inzlicht, McKay, & Aronson, 2006). Ego depletion is also associated with difficulty adhering to health related behaviors important to self-care, such as dietary decision making and exercise (Baumeister et al., 1998; Hagger et al., 2010; Muraven et al., 1998; Vohs & Heatherton, 2000).

Although the literature does acknowledge that race related stress, including racial microaggressions, tends to have negative long-term outcomes on both the physical and psychological well-being of African Americans, there has been limited research suggesting which factors may most contribute to these consequences. Scholars have suggested a link between ambiguous race related stressors and ego depletion; however, further investigation is needed to examine the mechanisms involved in this relationship (Inzlicht & Kang, 2010; Salvatore & Shelton, 2007; Sue, Capodilupo, et al., 2007). Some research suggests that race

related microaggressions are particularly harmful because their characteristic ambiguity fosters much longer duration of cognitive and emotional processing, and increased negative affective arousal, as the individual attempts to categorize and analyze what he or she has experienced (Bennett et al., 2004; Sue et al., 2007; Torres & Driscoll, 2010). However, psychological factors related to uncertainty and attributional ambiguity, such as rumination, have not been examined as potential mediating links between ambiguous race related stress and negative outcomes. The current study proposes perseverative cognition, a psychological construct conceptually related to rumination, as a potential mediator in the hypothesized relationship between ambiguous race related stress and ego depletion.

The purpose of the current study is to expand the current literature by exploring and comparing the effect that ambiguous versus blatant race related stressors have on ego depletion. This study proposes that ambiguous race related stressors are especially harmful because they result in a more pronounced state of ego depletion relative to blatant race related stressors. This study further suggests that perseverative cognition is the mediational mechanism by which race related stressors lead to ego depletion. Within this hypothesized mediation model, attributional ambiguity related to the role of race in a given situation is proposed as a variable which moderates the relationship between a race related stressor and perseverative cognition. The implications of ego depletion as a potential consequence of race related stress are also discussed, particularly in terms of the impact that this may have on the overall well-being of African Americans.

Review of the Literature

To fully appreciate the relationship between ego depletion, perseverative cognition, and race related stress as described in the present study, it is necessary to review the relevant literature on these constructs.

Ego Depletion

Self-control has been described as an active, deliberate form of self-regulation that involves an individual's effortful control over his or her desires, impulses, and behaviors (Baumeister et al, 1998; Baumeister et al., 2007; Baumeister, Muraven, & Tice, 2000; Hagger et al., 2010). Self-control has been implicated in governing acts of volition such as making decisions, maintaining attention, making and executing plans, taking responsibility, resisting temptation, regulating emotion and affect, initiating and/or inhibiting behavior, and persisting toward a goal in the face of frustration (Baumeister et al., 1998; Hagger et al., 2010; Muraven , Tice & Baumeister, 1998). Research has indicated that self-control plays a crucial role in health related behaviors such as eating habits (Baumeister et al., 1998; Vohs & Heatherton, 2000), sexual behaviors (Muraven et al., 1998) and the use of tobacco (Russell, 1971), alcohol (Baumeister, 2003), and other substances (Muraven, et al., 1998; Hagger et al., 2010). Self-control is also key in managing social interactions and impressions, and in the maintenance of positive interpersonal relationships (Kelly & Conley, 1987; Muraven et al., 1998). There is also a link between self-control, frustration, and aggression which suggests that self-control has a significant impact on violence and criminal behaviors (Baumeister, 1997; Gottfredson & Hirschi, 1990; Muraven et al., 1998; Tice & Baumeister, 1993).

Baumeister and colleagues describe self-control as a resource that is important to regulating behaviors that likely have a significant long-term impact on an individual's health, well-being, success, and achievement (Baumeister et al, 1998; Baumeister et al., 2007; Hagger,

Wood, Stiff & Chatzisarantis, 2009; Muraven et al., 1998). However, this valuable resource is not unlimited. Baumeister et al. conceptualize self-control using a strength model, which views self-control as a type of finite energy which may be depleted through acts of effortful self-control. In the strength model, self-control is likened to a muscle which has the energy to exert a limited amount of strength, and becomes unable to exert the same level of energy when the muscle becomes fatigued and strength capacity is diminished (Baumeister et al., 1998; Baumeister et al., 2007; Muraven & Baumeister, 2000; Muraven et al., 1998). According to this model, various acts of self-control all draw on the same limited psychic energy resource that, when tapped, results in diminished capacity for further acts of self-control. This reduction in the capacity for subsequent exertion of self-control is referred to as *ego depletion*.

To empirically demonstrate the ego depletion effect, researchers typically have implemented the dual-task research paradigm (Hagger et al., 2010). The dual-task paradigm requires research participants to complete two unrelated tasks. In the experimental (ego depletion) condition, participants complete two consecutive tasks that, though different, both involve some form of effortful self-control. These tasks are, therefore, presumed to tap the same reservoir of energy required to exert self-control. In the control (non-ego depletion) condition, participants complete two consecutive tasks, but only the second task requires the participants to exert self-control. Based on the strength model of self-control and ego depletion, participants in the experimental (ego depletion) condition are expected to exhibit significantly impaired performance on the second task than participants in the control group, due to depletion of the limited self-control resource in the first experimental task (Hagger et al., 2010). A variety of tasks intended to measure self control have been implemented in this research paradigm (Hagger et al., 2010). The tasks span several domains that are associated with self-control including

executive function, persistence, attention, concentration, stamina, inhibition of aggression, emotion regulation, thought suppression, and temptation resistance (Baumeister et al., 1998; Hagger et al., 2010; Muraven et al., 1998).

The Strength Model of Self-Control

Baumeister et al. (1998) used the dual-task research paradigm in a series of experimental studies to demonstrate the ego-depletion effect as predicted by the strength model. In a study of 67 undergraduate participants, participants in the experimental group were asked to eat radishes, and were instructed not to eat the chocolate chip cookies that were placed in front of them. In contrast, participants in a comparison group were not asked to eat radishes, and were permitted to eat as many cookies as they would like. A third group was not presented with any food, and completed only the second task in the experiment. Relative to the other groups, participants in the radish-only group exhibited decreased frustration tolerance and persistence, as measured by time spent working the second task, an unsolvable geometric puzzle. These results suggest that the self-control required to resist the cookies left participants in the radish-only group in a state of ego depletion with significantly reduced capacity to persist at a frustrating task (Baumeister et al., 1998).

In the second experiment in the Baumeister et al. (1998) ego depletion study, 39 undergraduate participants were asked to make counterattitudinal speeches regarding a proposed tuition increase under either high choice (i.e., high cognitive dissonance) or no choice (i.e., low cognitive dissonance) conditions. After expressing verbal agreement to make the speech, participants were asked to work on the same unsolvable geometric puzzle described above. Analyses indicated that participants in the high cognitive dissonance condition exhibited less persistence on the puzzle than participants in the low cognitive dissonance and no speech,

control, conditions. Baumeister and colleagues posit that making an act of choice, especially in regards to a difficult or counterattitudinal choice, involves deliberate self-control and is likely to result in a significantly reduced ability to successfully engage in further acts of self-control.

In a third experiment (Baumeister et al., 1998), 30 undergraduate participants were divided into two experimental groups and one control group. In the experimental condition, participants were shown a ten minute emotionally arousing video clip. Participants in the ego depletion condition were asked to try to suppress any feelings and emotions they may have while watching the clip. Participants in the no ego depletion condition were instructed to express their feelings and emotions freely as they wished. After watching the video, participants were given anagram puzzles to complete. The results revealed that, when compared to participants who were not asked to suppress their emotions, participants who were asked to stifle their emotional reactions experienced ego depletion, as indicated by significantly impaired performance on the anagrams.

This series of studies provides evidence that the experimental tasks employed (i.e., resisting tempting food, making counterattitudinal choices, suppressing emotion and affect, persisting at difficult tasks, and tolerating frustration) all require the use of a limited pool of self-control, and that exerting self-control in one domain makes subsequent acts of self control more difficult, even in a seemingly unrelated domain. However, Baumeister and colleagues note that it remains unclear what psychological or physiological mechanisms contribute to the effect of ego depletion. The current study aims to add to the literature on ego depletion by proposing perseverative cognition as a psychological variable that may impact ego depletion effects related to experiences with race related stress.

Evidence of the Ego Depletion Effects of Race Related Stress

Inzlicht and colleagues (2006) argue that members of stigmatized groups, such as African Americans, must use self-control resources to attempt to cope with being targets of prejudice. Consequently, experiences with race related stress (e.g., racial discrimination, racial stigma) drain self-control resources, resulting in ego depletion. A correlational study of 38 African American undergraduates revealed that greater awareness of stigma and prejudice against African Americans was significantly related to impaired self-regulation (i.e., ego depletion) and poorer academic performance (Inzlicht et al., 2006). In a related study of 21 African American and 21 European American undergraduates, Inzlicht and coworkers provide evidence that increased awareness of negative racial stereotypes (i.e., stereotype threat) predicts ego depletion in African Americans.

To demonstrate this effect, participants in a high stigma experimental condition were told that they were to be administered a verbal test that is diagnostic of true intellectual ability. This method was implemented to activate negative stereotypes related to African Americans and intellectual ability. Participants in the low stigma condition were told that the verbal test was not diagnostic of intellectual ability. All participants were administered the Stroop color naming task. The Stroop task is typically used as a measure of executive function and attention, and has been used in the dual-task paradigm as a dependent measure of ego depletion (Hagger et al., 2010). African American participants in the high stigma condition demonstrated significantly impaired performance on the Stroop task relative to African American participants in the low stigma condition. This provides evidence that race related stress may induce ego depletion. Interestingly, no significant differences were detected in European American participants across conditions.

Inzlicht & Kang (2010) provide additional evidence that race related stress, including stress related to threats against racial group identity (e.g., stereotype threat), results in self-control resource depletion. They argue that performance in domains requiring effortful self-control is impaired whenever an individual perceives that his or her social group (e.g., race/ethnicity, gender, religion) is devalued by the social environment at large (Inzlicht & Kang, 2010). To demonstrate this effect, they asked 91 participants to vividly describe a negative personal experience. Participants then completed a laboratory measure of risky decision making. Analyses indicated that participants who described negative experiences related to discrimination (i.e., social identity threat) made significantly riskier decisions than participants who described experiences unrelated to discrimination (Inzlicht & Kang, 2010).

In another study of social identity threat and self-control, 29 women and 13 men completed a set of mathematics problems. Women in the social identity threat condition were told that the problems were intended to be “a genuine test of math intelligence” as a means of strengthening stereotype threat reactions related to women performing poorly at math. After the math task, participants were administered the Stroop color naming task. Women in the social identity threat condition showed significantly impaired performance on the Stroop task compared to men, as well as women in the no social identity threat condition (Inzlicht & Kang, 2010). Other research has supported the assertion that social identity threat depletes executive resources, leading to impaired performance on domains of self regulation, such as working memory (Johns, Schmader, & Inzlicht, 2008; Schmader, Johns, & Forbes, 2008). These results imply that reminders of a negative stereotype or stigma related to an individual’s social group identity has lingering cognitive and psychological effects that interfere with the capacity to successfully exert control over a variety of domains. Based on this conceptualization of social identity threat and

self-control, it follows that African American's experiences with race related stress are likely to lead to a state of ego depletion.

A study comparing the impact of overt versus ambiguous racism related stress on cognitive functioning of 122 African American and 128 European American participants, as measured by the Stroop color naming task, indicates that African Americans' cognitive performance was significantly impaired in the ambiguous condition relative to the overt condition (Salvatore & Shelton, 2007). In contrast, the European American participants' cognitive performance suffered more in the overt racism condition compared to the ambiguous condition. This suggests that African Americans are more likely to appraise ambiguous race related stimuli as stressful, compared to European Americans. This study also provides empirical evidence that African Americans are negatively affected by ambiguous race related stressors significantly more than overt stressors, and experience noticeable cognitive depletion as a result. Although Salvatore and Shelton did not use the term ego depletion in describing their hypotheses or findings, their description of the "cognitive depletion" effects found in African Americans in the ambiguous racism condition sounds virtually identical to the conceptualization of ego depletion. It is clear that African Americans' exposure to ambiguous race related stimuli temporarily, but significantly, impairs psychological and cognitive ability.

An experimental design that randomly assigned 74 African American men to listen to audio taped vignettes with blatant racist or ambiguous interpersonal content found that participants who attributed high levels of racism to the ambiguous vignette had the highest negative affect reactivity, and experienced a longer duration of negative affect, even compared to the participants who were exposed to the blatant racism vignette (Bennett et al. 2004). In discussing these findings, Bennett and colleagues (2004) argue that, although overt race related

stressors may be associated with an initial increase in negative affect, these stressors require far less cognitive and emotional energy than ambiguous stressors. Therefore, compared to overt race related stimuli, ambiguous race related stressors result in longer lasting psychological and physiological reactions that may have deleterious effects on overall health (Bennett et al., 2004). Interestingly, this study also found that participants who had personal experiences with racial discrimination prior to participating in this study were more likely to view the ambiguous interpersonal scenario as racist (Bennett et al., 2004). This finding suggests that it will be beneficial to control for the effect of prior exposure to race related stress when examining the impact that ambiguous and blatant race related stressors have on ego depletion, as in the current study.

Researchers have made some preliminary suggestions regarding variables that may cause a stressor to have an ego depleting effect. Some argue that the act of coping with stress depletes self-control resources (Inzlicht et al. 2006; Inzlicht & Kang, 2010). Others point to a process involving a combination of factors such as physiological stress responses that inhibit cognitive processing, active self-monitoring, and active suppression of thoughts and emotions related to the stressor (Johns, Schmader, & Inzlicht, 2008; Schmader et al., 2008). However, no studies have investigated the role that attributional ambiguity, rumination, or perseverative cognition may have on ego depletion effects, or differences in how blatant and ambiguous race related stressors impact the amount of perseverative cognition and ego depletion experienced.

Race Related Stress

General Stress, Appraisal and Coping: The Lazarus and Folkman Model

Lazarus and Folkman's (1984) classic model of stress, cognitive appraisal, and coping provides a basic framework for understanding the construct of stress and its psychological

effects. Stress is defined as “a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and as endangering well being” (Folkman, Lazarus, Gruen, & DeLongis, 1986, p. 572). The Lazarus and Folkman model conceptualizes stress as a result of the dynamic interaction between the individual and the environment. According to Lazarus and Folkman, whether or not an environmental stimulus is perceived as stressful depends on an individual’s cognitive appraisal of the stimulus. Cognitive appraisal is the evaluation of an event or environmental cue in which the individual assesses the effect that the event is likely to have on his or her well-being (Lazarus & Folkman, 1984). Lazarus and Folkman identify two types of cognitive appraisal: primary appraisal and secondary appraisal.

Primary appraisal involves the individual’s assessment of potential risks posed by the environment and an evaluation of what is at stake in the situation. A negative or harmful event that poses a threat to the individual’s physical, psychological or social well-being is appraised as stressful (Lazarus & Folkman, 1984). During secondary appraisal, the individual evaluates possible coping strategies and determines if there are resources that might be utilized and implemented successfully and effectively in the situation with which he or she is faced that has been appraised as stressful through primary appraisal. The final component in the Lazarus and Folkman model is coping.

Coping involves exerting mental, emotional, and/or physical effort in an attempt to effectively manage stress. The coping style utilized may vary according to the environment or other situational factors, and the desired outcome will not always occur (Lazarus & Folkman, 1984). A person’s belief regarding the amount of control that he or she has over a situation

greatly influences the way in which the situation is appraised as well as what type of coping strategies will be used (Lazarus & Folkman, 1984).

Race Related Stress, Appraisal and Coping: The Outlaw Model

Although the model proposed by Lazarus and Folkman (1984) provides a solid conceptual framework with which to examine stress and the construct of cognitive appraisal, it does not directly address racism related stressors. Outlaw (1993) modified the Lazarus and Folkman (1984) model of stress and appraisal to apply it specifically to African Americans' appraisal of racism related stressors. Outlaw asserts that, since racism related stress is such a salient aspect of many African Americans' experience, it is necessary to have a conceptual framework specific to racism related stress, appraisal and coping. She suggests that African Americans' repeated experiences with racism and racism related stressors induce a state of increased vigilance in which every situation is consciously or unconsciously appraised for the risk of encountering racism (Outlaw, 1993).

Consistent with the Lazarus and Folkman (1984) model, Outlaw breaks down situations appraised as stressful into three appraisal categories of harm/loss, threat and challenge. In a harm/loss racism related stressor, the individual has experienced some type of harm (e.g., subjected to a racial slur; faced with racial discrimination at school or in the workplace) or loss (e.g. denial of housing due to race; loss of self-esteem as a result of racism). The appraisal of a racism related stressor as a threat is associated with the anticipation of harm or loss that is likely to occur, but has not yet transpired (Lazarus & Folkman, 1984; Outlaw, 1993). Outlaw (1993) describes racism related stressors that result in challenge appraisals as inducing hope and/or faith-based coping in African Americans, and suggests that challenge appraisals may stimulate emotional growth.

Race Related Stress: The Harrell model

Recognizing the complexity of the construct of race related stress, Harrell (2000) attempts to conceptualize race related stress and describe its impact on well being. The definition of racism related stress provided in this conceptualization was adapted from Lazarus and Folkman's (1984) definition of stress described above. Harrell defines race related stress as "the race related transactions between individuals or group and their environment that emerge from the dynamics of racism, and that are perceived to tax or exceed existing individual collective resources or threaten well-being" (Harrell, 2000, p. 44). In her conceptualization, Harrell argues that race related stress is prevalent, and takes numerous forms. Some race related stressors are blatantly obvious and some are subtle or covert. They range from single, discrete events to chronic stressors that are insidiously woven into social or institutional contexts. Race related stress may be triggered by personal experiences with racism, or even by hearing of experiences that others have had with racism. Harrell uses the term microstressors to describe common, ambiguous race related stressors.

Race related microstressors are subtle and occur frequently and serve as a constant reminder to African Americans that their race may provoke an unavoidable response from the environment (Harrell, 2000). These microstressors are often covert, and may be unintentional or unconscious of the perpetrator. Though they may go unnoticed by casual observers, these stressors may be experienced as demoralizing, humiliating, and disrespectful. Harrell includes being mistaken for someone who serves others, or being closely watched while shopping in a store (due to assumed criminality) as examples of racism related microstressors. According to Harrell, microstressors are the most common experience of racism related stress, and the

accumulation of microstressors as they occur repeatedly over time typically contributes the most stress compared to other racism related stressors (Harrell, 2000).

Race Related Microaggressions

In recent years, psychologists have examined an insidious form of race related stress known as racial microaggressions, a term first used by Pierce in 1970 (Pierce, 1970; Solorzano et al., 2000; Sue, Capodilupo, et al., 2007; Sue et al., 2008). Microaggressions are conceptually identical to the race related microstressors described by Harrell (2000). They are commonly experienced in every day interpersonal interactions and environmental cues, and portray messages of racial insensitivity, invalidation, and devaluation (Sue et al., 2008). Scholars have identified microaggressions as an automatic and pervasive form of cultural racism that subtly minimize the social importance and achievements of non-whites (Oliver, 2001; Pierce, 1970). Though these messages may be portrayed unconsciously by the perpetrator, they are experienced as derogatory and denigrating by the target (Sue, Capodilupo, et al., 2007; Sue et al., 2008).

The hallmark features of race related microaggressions are their chronic prevalence in the environment, and the uncertainty and attributional ambiguity associated with these stressors (Sue, Capodilupo, et al., 2007; Sue et al., 2008; Torres & Driscoll, 2010). Although microaggressions are experienced as offensive and insulting, they are usually covert, and may be “explained away” by perpetrators and observers. As a result, the target of the microaggression often struggles to make meaning of the interaction or incident. This characteristic ambiguity leaves the target unsure about the intentions of the perpetrator, and racial messages hidden in the interaction, as well as uncertain of how to react to the incident (Sue, Capodilupo, Nadal, & Torino, 2008; Sue et al., 2008). The additional stress of attributional ambiguity is typically not a factor in race related stressors that are overt and blatant, as acts that are obviously rooted in racial

prejudice or discrimination give the target a clear explanation for the perpetrator's motivation (i.e., racist beliefs) (Sue, Capodilupo, et al., 2007).

Sue and colleagues conceptualize microaggressions as falling into three categories: microassaults, microinsults, and microinvalidations (Sue, Capodilupo et al., 2007). Microassaults refer to explicit verbal or behavioral cues intended by the perpetrator to portray the message that the African American target is unimportant, unwelcome, or otherwise inferior. Although the microassault is intentional on the part of the perpetrator, the target may still have some level of uncertainty regarding the racial undertones of the event (Sue, Capodilupo, et al., 2007). An example of a microassault is a retail worker deliberately failing to acknowledge an African American customer. Microinsults are characterized by rude or belittling verbal or nonverbal cues that communicate an inherent belief in the inferiority of African Americans. Microinsults are often expressed as slights or snubs, and are frequently unconscious or unintentional on the part of the perpetrator (Sue, Capodilupo, et al., 2007). An example of a microinsult is an expression of surprise in response to hearing of the academic achievement of an African American student. Microinvalidations include covert messages that deny, negate or pathologize the feelings, experiences, worldview, and/or values of African Americans. Examples include statements that racism no longer exists in America, or suggesting that African Americans are overly sensitive about racial issues (Sue, Capodilupo, et al., 2007).

Sue and colleagues provide seven categories for microaggressions typically experienced by African Americans in interpersonal interactions (Sue, Capodilupo, et al., 2007). Three categories include experiences that may be categorized as microinsults, such as ascription of intelligence (e.g., "you are so articulate"), assumption of criminality (e.g., being closely observed while shopping), and being treated as a second-class citizen (e.g., receiving inferior service

relative to European Americans). Four categories involve experiences that may be categorized as microinvalidations, such as color blindness (e.g., “when I look at people, I don’t see color”), denial of individual racism (“some of my friends are Black”), myth of meritocracy (“anyone can succeed with hard work”), and pathology of cultural values or expression (“don’t be so emotional”) (Sue, Capodilupo, et al., 2007).

One qualitative study of four male and nine female African American participants ranging in age from 23-33 years old provides evidence for the prevalence of microaggressions (Sue et al., 2008). Qualitative analyses indicated that the messages of the microaggressions experienced by the participants fell into five categories: “you do not belong,” “you are abnormal,” “you are intellectually inferior,” “you are untrustworthy,” and “you are all the same” (Sue et al., 2008).

A mixed methods longitudinal study of 248 African American doctoral students and recent graduates from doctoral programs demonstrated that exposure to race related microaggressions is significantly associated with perceived stress and prolonged symptoms of depression (Sue et al., 2008). Although this study provides evidence that ambiguous race related stressors may have negative long-term mental health consequences, it did not compare the effects of ambiguous race related stressors to blatant race related stressors.

Although there has been some focus in the literature on describing examples of microaggressions, and the negative emotions associated with these experiences (Sue et al., 2007; Sue et al., 2008; Solorzano et al., 2001), there has been minimal research that aims to elucidate the mechanisms that make these ambiguous stressors so harmful (Torres & Driscoll, 2010). The current study seeks to expand on the current literature by proposing that ambiguous race related stressors have a deleterious impact on the well-being of African Americans due to their ego

depleting effects. Further, this study suggests perseverative cognition as a possible mediating factor in the relationship between ambiguous race related stress and ego depletion, and proposes attributional ambiguity as a moderating variable in the relationship between race related stress and perseverative cognition.

Perseverative Cognition

Perseverative cognition is defined as “the repeated or chronic activation of the cognitive representation of stress-related content” (Brosschot et al., 2005, p. 1045). Perseverative cognition involves mentally retaining the stressor, keeping it cognitively active, and thereby prolonging the physiological and psychological experience of stress associated with the event (Brosschot et al., 2005; Brosschot et al. 2006). The construct of perseverative cognition is conceptually identical to the cognitive process of rumination (Brosschot et al., 2005, Brosschot et al., 2006). Perseverative cognition not only prolongs the experience of stress but also increases stress by keeping an individual in a state of cognitive arousal in which he or she is thinking excessively about the stressor, possible explanations for it, and possible responses to it (Brosschot et al. 2006).

Brosschot et al. (2006) suggest that the process of perseverative cognition is most common when an individual is faced with stressors that are accompanied by uncertainty, or seem to be out of his or her personal control. In applying the conceptualization set forth by Brosschot and colleagues to race related stress, it would follow that the effect of a race related stressor is most harmful when an individual ruminates about the event. This perseverative cognition keeps the stressor active in the individual’s psyche, increasing the negative impact by extending physiological arousal (Brosschot et al., 2005; Brosschot et al., 2006). Prior research has indicated that African Americans expend much cognitive energy in attempting to process racism related stress (Essed 1991; Harrell, 2000; Salvatore & Shelton, 2007).

Perseverative Cognition and Attributional Ambiguity

Perseverative cognition is especially likely to occur when a racism related stressor is somewhat ambiguous (Bennett et al., 2004; Salvatore & Shelton, 2007). Scholars have suggested that every day race related microaggressions tend to be especially ambiguous in nature (Harrell, 2000; Pierce, 1970; Sue, Capodilupo, et al., 2007). Thus, racial microaggressions and other subtle race related stressors are particularly dangerous because they may lead to the most perseveration. This is especially true when others deny the racist implications of the situation, or when the individual is otherwise challenged or made to feel uncertain regarding his or her appraisal of the situation as related to race (Harrell, 2000; Sue, Capodilupo, et al., 2007). When an individual experiences attributional ambiguity about whether or not a stressful incident is actually related to race, he or she is more likely to mentally replay the stressor over and over, re-explain the event to others, consider possible alternative responses and reactions to the event, and otherwise excessively ruminate (Harrell, 2000; Pierce, 1995). This perseverative cognition, fostered by attributional ambiguity, increases and extends the experience of stress above and beyond the initial stressor (Brosschot et al., 2005; Brosschot et al., 2006; Pierce, 1995).

The Current Study

The current study explores the relationship between race related stress, attributional ambiguity, perseverative cognition, and ego depletion, using experimental research methodology. Specifically, blatant race related stress is compared with ambiguous race related stress in regards to their relative impact on the constructs of ego depletion and perseverative cognition (Baumeister et al., 1998; Brosschot et al., 2005; Brosschot et al., 2006). Perseverative cognition is also examined as a potential mediating psychological variable in the relationship between race related stress and ego depletion. Additionally, attributional ambiguity is

hypothesized to moderate the effect of race related stress on perseverative cognition. Refer to Figure One for a graphic representation of the moderated meditation model proposed in this study.

Prior research suggests that participants' previous experiences with race related stressors is an important covariate to consider (Bennet et al, 2004). Because ambiguous race related events such as microaggressions are theoretically tied to cultural racism (Oliver, 2001), individuals' past exposure to and experiences with cultural race related stress is proposed as a covariate in this study. The hypotheses of this study are as follows:

Hypothesis 1

There is evidence that ambiguous race related stress is associated with more negative psychological consequences relative to blatant race related stress (Bennett et al., 2004; Salvatore & Shelton, 2007). Consequently, it is hypothesized that ambiguous race related stress is associated with increased ego depletion effects compared to blatant race related stress, or no race related stress, when controlling for past exposure to cultural race related stress.

Hypothesis 2

Stressors that generate feelings of uncertainty are associated with increased perseverative cognition (Brosschot et al., 2005; 2006). Therefore, it is hypothesized that ambiguous race related stress is associated with increased perseverative cognition compared to blatant race related stress, or no race related stress, when controlling for past exposure to cultural race related stress.

Hypothesis 3

Perseverative cognition is proposed to be a psychological mechanism by which race related stress leads to ego depletion. Thus, it is hypothesized that perseverative cognition will mediate the relationship between race related stress and ego depletion.

Hypothesis 4

Within the context of the proposed meditational model, attributional ambiguity is hypothesized to moderate the strength of the relationship between race related stress and perseverative cognition.

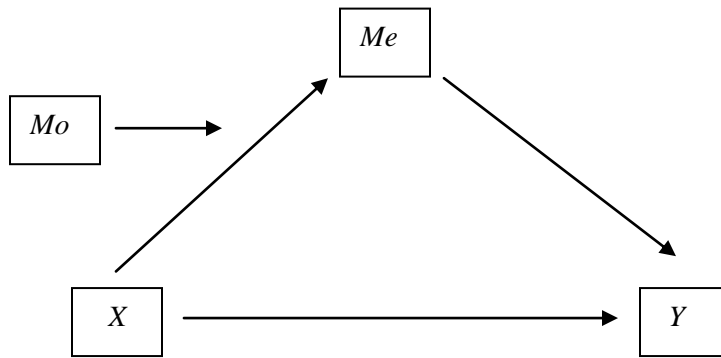


Figure 1. Hypothesized moderated mediation model.

Note. *X* = race related stress. *Y* = ego depletion. *Me* = perseverative cognition. *Mo* = attributional ambiguity.

Method

Participants

Participants were 159 self-identified African American undergraduate college students enrolled in introductory psychology courses at a large, urban, public university in the southeastern United States. The sample was 64.2% female ($n = 102$) and 35.8% male ($n = 51$), and the age of the participants ranged from 18 to 40 years old ($M = 19.86$ years), with 91.2% ($n = 145$) falling between the ages of 18 and 22. Of the participants in the sample, 54.7% ($n = 87$) were freshmen, 28.9% ($n = 46$) were sophomores, 8.2% ($n = 13$) were juniors, and 8.2% ($n = 13$) were seniors.

Participants were randomly assigned to one of three conditions: ambiguous race related stress ($n = 56$), blatant race related stress ($n = 51$), and no stress/control ($n = 52$). Of the participants in the ambiguous race related stress condition, 76.8% ($n = 43$) were female and 23.2% ($n = 13$) were male, and participants ranged in age from 18-37 years old with a mean age of 19.3. Of these participants, 64.3% ($n = 36$) were freshman, 23.2% ($n = 13$) were sophomores, 5.4% ($n = 3$) were juniors, and 7.1% ($n = 4$) were seniors.

The blatant race related stress condition consisted of 50.9% ($n = 26$) female and 49.1% ($n = 25$) male, and participants ranged in age from 18-40 years old with a mean age of 20.6. Of these participants, 49% ($n = 25$) were freshman, 33.3% ($n = 17$) were sophomores, 7.8% ($n = 4$) were juniors, and 9.8% ($n = 5$) were seniors.

The participants in the no stress/control condition were comprised of 63.5% ($n = 33$) women and 36.5% ($n = 19$) men, and participant ages ranged from 18-28 years old with a mean age of 19.8. Of the participants in this condition, 50% ($n = 26$) were freshman, 30.8% ($n = 16$) were sophomores, 11.5% ($n = 6$) were juniors, and 7.7% ($n = 4$) were seniors.

All participants were granted research participation credit applied to the research participation credit requirement of their introduction to psychology courses.

Measures

Demographic Data. (Appendix A) Participants were asked to complete a form containing demographic and personal status information. Items include age, gender, and academic classification.

Attributional ambiguity item. (Appendix B) A single item was used to assess participants' uncertainty (i.e., attributional ambiguity) regarding whether the incident (e.g., motivation for the perpetrator's behavior) should be attributed to the participants' race.

Participants were asked to respond to this item, “how confident are you that the event you just described occurred because of your race,” using a 6-point rating scale ranging from *completely unconfident* to *completely confident*. Lower scores on this item indicate higher attributional ambiguity.

Stroop Color Naming Task (Stroop, 1935). The Stroop task is an individually administered, timed task of attention and cognitive flexibility. The Stroop task is comprised of three 45 second trials during which participants are instructed to read, as quickly as they can, a list 100 colors or names of colors, printed on one page in a five by 20 matrix. In trial one, participants read a list of randomized color names (i.e., red, green, blue) printed in black ink. In trial two, participants are presented with a page of characters (i.e., XXXX) each printed in a different color of ink (i.e., red, green, blue). Participants are instructed to provide the name of the ink color of each block of characters. In trial three, participants are presented with a list of randomized color names, each printed in a different color of ink, and are asked to name the color of the ink, ignoring the printed name of the color. For example, the word “red” typed in blue ink should generate a response of “blue.” The time required for participants to complete trial three is typically significantly increased compared to trials one and two, due to the color-word interference effect (Golden & Freshwater, 1998). The color-word interference demonstrated on this task was used to measure the outcome variable of ego depletion. Standardization and normative research indicates that the mean for color-word interference score in non-clinical populations is 50 and standard deviation is 10 (Golden & Freshwater, 1998). For the current sample, the color-word interference score mean is 52.70 and standard deviation is 10.03.

Perseverative Cognition scale (Utsey & Belvet, 2011). (Appendix C). The items on this measure were adapted from the Intrusiveness subscale of the Impact of Event Scale, a self-report

pencil and paper scale that is used to measure rumination and intrusive thoughts associated with a specific event (IES; Horowitz, Wilner, & Alvarez, 1979). The resulting five-item Perseverative Cognition scale is intended to measure ruminative/perseverative thoughts that participants experienced during the course of the experiment, specifically related to the experimental manipulation. Participants indicated how bothered or distracted they were by thoughts, feelings, or images related to the experimental manipulation by responding to the six-point rating scale ranging from *Strongly Disagree* to *Strongly Agree*. Higher scores indicate increased perseverative cognition. The Cronbach's alpha of the Perseverative Cognition scale for the current sample was .81.

Cultural Race Related Stress subscale of the Index of Race Related Stress – Brief Version (IRRS; Utsey, 1999). (Appendix D). The IRRS is a ten-item, self-report, pencil and paper scale that is used to measure the extent of participants' prior experiences with cultural race related stress. The scale is composed of ten types of events or encounters with cultural racism, and participants indicate their experiences with these events using five-point rating scale with responses ranging from *this never happened to me* to *this happened to me and I was extremely upset*. Higher scores on this measure indicate more stressful experiences with cultural race related stress. The validation study for this measure reported a Cronbach's alpha of .78 (Utsey, 1999). The Cronbach's alpha for the current sample was .82.

Procedure

Participants were scheduled to participate in this study in groups of no more than ten at a time. Participants were randomly assigned to one of three experimental conditions: ambiguous race related stress, blatant race related stress, and no stress/control.

The experimental manipulation consisted of asking participants to vividly remember images, thoughts, and feelings related to a past occurrence. Participants were then asked to spend five minutes writing a description of the event or occurrence, including an account of the feelings and thoughts they had during and after the event. This experimental manipulation has been previously used as the initial task in a dual-task paradigm, and is intended to induce the same cognitions and emotions that the participants experienced at the time of the event they are asked to recall (Inzlicht & Kang, 2010).

Specifically, participants in the ambiguous race related stress condition were asked to recall and write about a situation or event that was negative or stressful for them in some way that they *think* may have occurred because of their race, or racism, but they are not completely sure. Participants in the blatant race related stress condition were asked to recall and write about a situation or event that was negative or stressful for them that they *strongly believe* occurred because of their race, or racism. Finally, participants in the no-stress control group were asked to think of and write about a hobby or pastime that they enjoy.

Following this task, participants were administered the Stroop color naming task, and asked to complete the perseverative cognition scale and the IRRS. Participants in the ambiguous and blatant race related stress conditions were also asked to complete the attributional ambiguity item.

Results

The research hypotheses of the present study were tested with a one-way between groups multivariate analysis of covariance (MANCOVA) and moderated mediation hierarchical multiple regression analyses (Preacher, Rucker, & Hayes, 2007). Specifically, I tested the hypotheses that (1) ambiguous race related stress is related to greater ego depletion, relative to

both blatant race related stress and no stress conditions, when controlling for past exposure to race related stress; (2) ambiguous race related stress is related to increased perseverative cognition, compared to blatant race related stress and no stress conditions, when controlling for past exposure to race related stress; (3) perseverative cognition mediates the relationship between type of race related stress (i.e., ambiguous v. blatant) and ego depletion; and (4) in the context of the mediational process by which race related stress has an impact on ego depletion via perseverative cognition, attributional ambiguity moderates the relationship between race related stress and perseverative cognition.

Preliminary analyses of the scores of the variables of interest revealed that there were no missing data or outliers, and that data met the basic assumptions of linearity and independence. Skewness and kurtosis values revealed non-normal (positively skewed and leptokurtic) distributions for the variables attributional ambiguity and perseverative cognition. Reflect and logarithm transformations were applied to these variables prior to running the primary analyses, resulting in normal distributions (Tabachnick & Fidell, 2007). A one-way analysis of variance failed to detect any significant differences between men and women on scores of perseverative cognition, attributional ambiguity, ego depletion, or exposure to cultural race related stress. Refer to Table 1 for descriptive statistics, bivariate correlations, and Cronbach’s alphas for each of the variables of interest.

Table 1

Descriptive Statistics and Bivariate Correlations

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Attributional Ambiguity	4.82	1.36	--			
2. Perseverative Cognition	12.14	2.79	-.29**	(.81)		
3. Ego Depletion	52.70	10.03	-.07	-.08	--	

4. IRRS-C	25.67	8.70	-.08	.25**	-.07	(.82)
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Note. IRRS-C = participants' exposure to cultural race related stress as measured by the cultural race related stress subscale of the Index of Race Related Stress (IRRS-C). Figures in parentheses are Cronbach's alphas.

** $p < .01$.

Hypotheses 1 & 2

(1) *Ambiguous race related stress is related to greater ego depletion relative to both blatant race related stress and no stress conditions, when controlling for past exposure to race related stress.* Additionally, (2) *ambiguous race related stress is related to increased perseverative cognition compared to blatant race related stress and no stress conditions, when controlling for past exposure to race related stress.* A one-way between groups MANCOVA with planned contrasts was implemented to test these hypotheses. The MANCOVA was used to examine whether mean differences exist among the three levels of the independent variable, experimental condition (i.e., ambiguous race related stress, blatant race related stress, or no stress), for the two dependent variables, ego depletion and perseverative cognition. Participants' past exposure to race related stress was entered as a covariate in this analysis to control for its influence.

The full sample of 159 participants was included in this data analysis (ambiguous condition $n = 56$, blatant condition $n = 51$, no stress condition $n = 52$). Preliminary assumption testing was conducted to check for assumptions of MANCOVA including univariate and multivariate normality, independence of observations, and homogeneity of variance-covariance matrices, with no violations noted. Power analysis using GPower indicates that a MANCOVA such as this with three experimental groups, two dependent variables, and one covariate requires

a sample size of 90 for adequate power to detect a medium effect size ($f^2 = .15$) (Dattalo, 2008). Therefore, the current sample size of 159 should be sufficient.

The analysis revealed that the covariate, exposure to race related stress, is significantly associated with perseverative cognition $F(2, 156) = 10.46, p < .01, \eta^2 = .06$ but not with ego depletion $F(2, 156) = .02, p = .90, \eta^2 = .00$. However, after controlling for past exposure to race related stress, there were no significant differences among the three experimental conditions of race related stress (i.e., ambiguous, blatant, and no stress) on ego depletion, Wilks' $\Lambda = .94, F(2,156) = .06, p = .94, \eta^2 = .00$, or perseverative cognition, Wilks' $\Lambda = .94, F(2,156) = .70, p = .50, \eta^2 = .01$ (refer to Table 2). Therefore, hypotheses 1 and 2 were not supported.

Table 2

MANCOVA results (Hypotheses 1&2)

Variable	Ambiguous				Blatant				Control			
	Mean	SD	F	Sig	Mean	SD	F	Sig	Mean	SD	F	Sig
PC	11.87	2.55	.70	.50	12.08	2.97	.70	.50	12.48	2.87	.70	.50
ED	52.80	9.64	.06	.94	52.98	10.13	.06	.94	52.70	10.03	.06	.94

Note. PC = perseverative cognition, ED = ego depletion as measured by the Stroop color naming task interference score.

Hypothesis 3

Perseverative cognition mediates the relationship between type of race related stress (i.e., ambiguous v. blatant) and ego depletion. This hypothesis only addresses the relationship between race related stress, perseverative cognition and ego depletion. Therefore, only data from the ambiguous race related stress and blatant race related stress conditions was used for this analysis, for a total sample size of 107 (ambiguous condition $n = 56$, blatant condition $n = 51$).

Hierarchical multiple regression was used to test the significance of the proposed mediation model that perseverative cognition is the mechanism by which race related stress has an impact on ego depletion. Preliminary analyses indicate that the data met assumptions for multiple regression including normality, linearity, multicollinearity, homoscedasticity, and independence.

There are four conditions that are required in order for rumination to be considered a mediator variable using multiple regression (Baron & Kenny, 1986; Holmbeck, 1997; Preacher & Hayes, 2004). The first condition is that the independent variable, race related stress, must have a significant relationship with the proposed mediator variable, perseverative cognition. The second condition is that type of race related stress must have a significant relationship with the dependent variable, ego depletion. Third, perseverative cognition must have a significant relationship with ego depletion. Finally, the influence of race related stress on ego depletion must decrease after controlling for perseverative cognition in the regression model. If there is no significant change in the effect of race related stress on ego depletion after controlling for perseverative cognition, then perseverative cognition does not mediate the relationship. If the relationship between the independent and dependent variable is no longer statistically different from zero after controlling for perseverative cognition, then the model is fully mediated. If the independent/dependent variable relationship decreases, but remains larger than zero, there is partial mediation.

Preacher and Hayes' (2004) method for analyzing mediation models was implemented to test these conditions via hierarchical multiple regression. Analyses revealed that type of race related stress (i.e., blatant or ambiguous) is not significantly related to perseverative cognition, $b(YX) = .16, p = .92$, type of race related stress is not significantly related to ego depletion, $b(MX) = -.41, p = .37$, and perseverative cognition is not significantly related to ego depletion,

$b(YM.X) = -.30, p = .30$. After controlling for perseverative cognition, the influence of race related stress on ego depletion remained non-significant, $b(YX.M) = .04, p = .98$ (refer to Table 3). Therefore, the hypothesized mediation model is not supported, and perseverative cognition does not mediate the relationship between race related stress and ego depletion.

Table 3

Regression Results for the Mediator Model (Hypothesis 3)

Equation	Coefficient	<i>t</i>	<i>p</i>
Effect of <i>x</i> on <i>m</i>	-.41	-.89	.37
Effect of <i>x</i> on <i>y</i>	.16	1.67	.92
Effect of <i>m</i> on <i>y</i>	.30	.29	.30
Effect of on <i>y</i> controlling for <i>m</i>	.04	.02	.98

Note. *x* = race related stress; *m* = perseverative cognition; *y* = ego depletion.

Hypothesis 4

In the context of the mediational process by which race related stress has an impact on ego depletion via perseverative cognition, attributional ambiguity moderates the relationship between race related stress and perseverative cognition. This hypothesis was tested using moderated mediation hierarchical regression, described by Preacher and colleagues (2007). Data from the ambiguous race related stress and blatant race related stress conditions was used for this analysis, for a total sample size of 107 (ambiguous condition $n = 56$, blatant condition $n = 51$).

In the proposed model (see Figure 1), the strength of the mediating effect of perseverative cognition is expected to be contingent upon the moderating effect of attributional ambiguity, such that perseverative cognition will increase as attributional ambiguity increases. Thus, the analyses tested for the significance of this moderated mediation model, also referred to as a

model of conditional indirect effect (Baron & Kenny, 1986; James & Brett, 1984; Muller, Judd, & Yzerbyt, 2005; Preacher, Rucker, & Hayes, 2007).

Preacher and colleagues provide specific guidelines for sample sizes required, and statistical techniques recommended, for adequate empirical power when conducting moderated mediator analyses (Preacher et al., 2007). According to these guidelines, bootstrapping is encouraged to increase statistical power. Bootstrapping is a non-parametric resampling approach that provides estimates of the sampling distribution confidence intervals for the conditional indirect effect (Preacher et al., 2007). It is estimated that, when testing a moderated mediator model similar to the one in the current study with a sample size of 107, there is between 95% and 100% null hypothesis rejection rate with a regression coefficient of .39, and a 100% null hypothesis rejection rate with a regression coefficient of .59, when implementing bootstrapping with 1000 resamples (Preacher et al., 2007). Thus, the current sample size of 144 is expected to be sufficient to detect statistically significant moderating and mediating effects with medium effect size. Bootstrapping with 1000 resamples was used for significance testing in the moderated mediation analyses in the current study.

To test for moderator effects in a model of conditional indirect effect, the moderator variable and the predictor by moderator interaction term were entered into the first equation of the three described above for tests of simple mediation. In addition to testing the influence of race related stress on perseverative cognition, attributional ambiguity and the attributional ambiguity x race related stress product (interaction) term, were also entered as predictor variables in the first regression equation. The second and third equations remained unchanged, as described above.

Results of these analyses indicate that attributional ambiguity does not moderate the relationship between race related stress and perseverative cognition, $race\ related\ stress\ x\ perseverative\ cognition = 2.38, p = .26$. Thus, the nature of the relationship between race related stress and perseverative cognition does not differ based on attributional ambiguity, and hypothesis 4 is not supported (refer to Table 4).

Table 4

Regression Results for the Moderated Mediator Model (Hypothesis 4)

	Coefficient	SE	t	p
<u>Path <i>xm</i></u>				
RRS	-.59	.75	-.78	.44
AA	-4.41	1.51	-2.92	.00
RRS x AA	2.38	2.10	1.13	.26
<u>Path <i>my</i></u>				
PC	-.05	.37	-.13	.88
RRS	-1.13	2.85	-.39	.69
AA	-5.06	5.93	-.85	.39
RRS x AA	4.44	7.95	.56	.58

Note. Path *xm* = path between race related stress and perseverative cognition in the context of the proposed mediational relationship between race related stress, perseverative cognition, and ego depletion. Path *my* = path between perseverative cognition and ego in the context of the proposed relationship. RRS = race related stress. AA = attributional ambiguity. PC = perseverative cognition.

Supplementary Analyses

Although the primary hypotheses were not supported, one interesting finding of this study is that the mean scores on attributional ambiguity among participants in the ambiguous race related stress group ($M = 4.66$) and blatant race related stress group ($M = 5.0$) were similar, with no statistically significant relationship between race related stress condition and reported attributional ambiguity, $F(1, 105) = 1.68, p = .20; R^2 = .02$. Participants across experimental

conditions generally reported low attributional ambiguity, indicating that participants tended to categorize their stressors as blatant or obvious, regardless of the type of race related stressor participants were instructed to imagine and keep in mind when responding to items related to attributional ambiguity and perseverative cognition. Additionally, the significant correlation between attributional ambiguity and perseverative cognition (see Table 1) demonstrates that perseverative cognition decreases as attributional ambiguity decreases (i.e., the more blatant a stressor is), which supports the relationship implied in the research hypotheses.

Discussion

Though there is a substantial body of research on the effect of race related stress on the health and well-being of African Americans, relatively few studies have compared ambiguous and blatant race related stressors and their psychological outcomes. The aim of the current study was to examine the impact of ambiguous versus blatant race related stressors on ego depletion in a sample of 159 African American undergraduate students using an experimental research design. The present study hypothesized that ambiguous race related stress is associated with greater ego depletion relative to blatant race related stress. This study also proposed and assessed the integrity of a moderated mediator model which suggests perseverative cognition as the mechanism by which a race related stressor leads to ego depletion, and names attributional ambiguity as a variable that is likely to moderate the strength of the relationship between race related stress and perseverative cognition. Statistical analyses failed to detect any significant differences in ambiguous versus blatant race related stressors on perseverative cognition or ego depletion, and did not support the proposed model.

Utilizing the attributional ambiguity item as a manipulation check suggests that the experimental manipulation (i.e., having participants identify and actively imagine either a blatant

or ambiguous race related stressor from their past experiences) was unsuccessful in clearly differentiating ambiguous and blatant race related stress conditions as distinct experimental groups. Participants in both race related stress conditions tended to report low attributional ambiguity, indicating that they believed the stressor they described to be blatantly race related. Researchers have noted that research participants may not always pay careful attention to study instructions, and/or may not be motivated to expend much mental energy while engaged in the study (Oppenheimer, Meyvis, & Davidenko, 2009). Such participants may be referred to as “satisficers,” as they often provide researchers with minimal effort, and tend to give the first responses that they can think of, even if these are not the best or most appropriate responses (Oppenheimer et al., 2009). Therefore, it is likely that many participants in the ambiguous race related stress condition chose to imagine a blatant race related stressor from their past because it was a more salient or accessible memory for them. Alternatively, the study instructions may not have been articulated clearly, and participants in the ambiguous race related stress condition simply may not have heard or understood the instructions to recall a stressor that they “*think*” was related to their race but that they “were not completely sure.” In either case, if participants in the ambiguous race related stress condition, tended to “satisfice” and report the most obvious or blatant race related stressor that they could recall, this contributed to a substantial decrease in experimental power, and an inability to detect significant differences between groups on the variables of interest (Oppenheimer et al., 2009).

Limitations

In addition to the issues related to insufficient experimental power presented above, there are other limitations that should be acknowledged. In the current study, perseverative cognition and attributional ambiguity were measured with the use of participants’ self-report of thoughts

and feelings related to a past stressful event. Although self-report is often used in stress research, this technique may pose a limitation to the study as it relies on the accuracy of participants' reporting. This may be especially problematic if participants are not motivated to provide the most accurate and appropriate response (Oppenheimer et al., 2009).

Additionally, the use of an undergraduate sample raises the issue of external reliability and extension of the results to African Americans in general. More than 90% of the study participants were between the ages of 18 and 22, and the types and extent of race related stressors experienced by individuals in this age range may be quite different than those who are older and have had a wider range of race related encounters. There is evidence that past experiences with race related stressors significantly impacts the way in which subsequent race related events are interpreted, especially ambiguous race related events (Bennett et al., 2004). Ambiguous race related stressors, such as racial microaggressions, are so pervasive and covert that the underlying racism may go unrecognized. This may be particularly true for younger adults who may not be fully aware of the history of racial oppression in America, and how it is currently manifested in subtle, chronic contextual racism. Therefore, the participants in the current study may have had more difficulty identifying and reporting ambiguous race related stressors relative to a sample with greater variation in age and life experience. Future research in this area would benefit from the use of a community sample with more diversity in age and experience.

Implications

This study set out to extend the existing literature by examining attributional ambiguity, perseverative cognition, and ego depletion as factors that may significantly contribute to the harmful effects of ambiguous race related stress, and that warrant further examination. Although

the present study did not detect a significant relationship between type of race related stress and ego depletion, past studies have suggested a link between these variables (Salvatore & Shelton, 2007), and continued exploration of these variables would be beneficial. Therefore, this study has implications regarding race related stress and ego depletion as a focus of ongoing research and practice in counseling psychology.

Ego depletion is an important construct to examine more carefully for a number of reasons. Ego depletion has been shown to lead to decreased ability to regulate emotions, and sustain persistence in the face of frustration, particularly on tasks related to academic performance (Baumeister et al., 1998; Hagger et al, 2010; Inzlicht et al, 2006). Continued research is needed to further explore implications regarding the impact of ambiguous race related stress on the academic and professional achievement of African Americans.

Tasks impacted by ego depletion effects are also highly likely to include health related behaviors such as dietary habits, exercise, substance use (e.g., reduction of alcohol intake, smoking cessation), and compliance with medications and other medical regimens (Hagger et al., 2009; Hagger et al., 2010). Additional studies are needed to determine if race related stress has a negative impact on implementing or maintaining these health behaviors in African American populations. Further investigation related to a possible link between race related stress and ego depletion may also have implications on clinical practice, especially in regards to increasing positive health related behaviors (i.e., reducing ego depletion effects) in African American populations with the aim of preventing and/or more effectively treating diseases related to the health behaviors described above. These diseases include, but are not limited to, diabetes, hypertension, cardiovascular disease, and obesity, all of which affect African Americans at disproportionately higher rates, relative to their European American counterparts (Carson &

Chamberlin, 2004; Davis, Liu, & Gibbons, 2003; Kreiger & Sidney, 1996; Shavers & Shavers, 2006).

Although the current experimental manipulation did not provide adequate power to support the initial hypotheses, the available literature provides support for the theoretical model proposed (Bennett et al., 2004; Brosschot et al., 2005; Brosschot et al., 2006; Salvatore & Shelton, 2007). The current study adds to the literature by indicating that future studies examining these variables are more likely to detect significant results with more powerful experimental manipulations. Ideal experimental manipulations that are likely to provide more power would involve participants being placed in race related scenarios or conditions *in vivo* as opposed to imagined, or recalled events. For example, previous studies investigating differences in African Americans' reactions to ambiguous versus blatant race related situations have successfully utilized experimental manipulations that involve presenting participants with written or audio taped vignettes depicting either ambiguous or blatantly racist situations (Bennett et al., 2004; Salvatore & Shelton, 2007). Such manipulations may provide more experimental power, and are thereby more likely to yield significant group differences. It would also be interesting to examine the impact that different types of race related stress have on various aspect of ego depletion such as frustration tolerance (i.e., using unsolvable anagrams) or temptation resistance (i.e., using radish/cookie paradigm) (Baumeister et al., 2007). Given the significant implications of ego depletion in the areas of achievement, health, and overall well-being, the extent of the effect that race related stress has on ego depletion in African American adults merits additional research. The creative research manipulations and numerous ego depletion outcome measures that may be employed make this a rich and exciting area for continued study.

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Appendix A

Demographic Data Sheet

1. **Age:** _____

2. **Sex:** Male Female

3. **Current academic classification:** Freshman Sophomore Junior Senior

Appendix B

Attributional Ambiguity Item

How confident are you that the event you just described occurred because of your race? (please circle one)

Completely unconfident

Somewhat unconfident

Slightly unconfident

Slightly confident

Somewhat confident

Completely confident

Appendix C

Perseverative Cognition scale version 1 (experimental groups)

DIRECTIONS: As you think about the event or situation you described in writing earlier, please indicate to what extent you have experienced each item below in the time that you have been here today. Please circle your answer.

In the time I have been here participating in this study...

1. I thought about the event when I didn't mean to

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
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2. I had waves of strong feelings about the event

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
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3. Pictures or images about the event popped into my mind

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
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4. I have replayed the event in my mind

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
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5. Thoughts, feelings, or images of the event have made it difficult to concentrate

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
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Perseverative Cognition scale version 2 (control group)

DIRECTIONS: As you think about the hobby or pastime you described in writing earlier, please indicate to what extent you have experienced each item below in the time that you have been here today. Please circle your answer.

In the time I have been here participating in this study...

1. I thought about the hobby when I didn't mean to

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
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2. I had waves of strong feelings about the hobby

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
------------------------------	------------------------------	-----------------	---------------------------	--------------	---------------------------

3. Pictures or images about the hobby popped into my mind

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
------------------------------	------------------------------	-----------------	---------------------------	--------------	---------------------------

4. I have replayed the hobby in my mind

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
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5. Thoughts, feelings, or images of the hobby have made it difficult to concentrate

<i>Strongly Disagree</i>	<i>Somewhat Disagree</i>	<i>Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
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Appendix D

Cultural Race Related Stress Subscale of the Index of Race Related Stress – Brief Version

(Utsey, 1999)

This survey questionnaire is intended to sample some of the experiences that Black people have in this country because of their "blackness." There are many experiences that a Black person can have in this country because of his/her race. Some events happen just once, some more often, while others may happen frequently. Below you will find listed some of these experiences; for which you are to indicate those that have happened to you or someone very close to you (i.e. a family member or loved one). It is important to note that a person can be affected by those events that happen to people close to them; this is why you are asked to consider such events as applying to your experiences when you complete this questionnaire. **Please circle the number on the scale (0 to 4) that indicates the reaction you had to the event at the time it happened. Do not leave any items blank.** If an event has happened more than once refer to the first time it happened. **If an event did not happen circle 0 and go on to the next item.**

0 = This never happened to me.

1 = This event happened, but did not bother me.

2 = This event happened & I was slightly upset.

3 = This event happened & I was upset.

4 = This event happened & I was extremely upset.

1. You notice that crimes committed by White people tend to be romanticized, whereas the same crime committed by a Black person is portrayed as savagery, and the Black person who committed it, as an animal. 0 1 2 3 4

2. You notice that when Black people are killed by the police the media informs the public of the Victim's criminal record or negative information in their background, suggesting they got what they deserved. 0 1 2 3 4

3. You have observed that White kids who commit violent crimes are portrayed as "boys being boys", while Black kids who commit similar crimes are wild animals.

0 1 2 3 4

4. You seldom hear or read anything positive about Black people on radio, T.V., newspapers or in history books.

0 1 2 3 4

5. You have observed the police treat White/non-Blacks with more respect and dignity than they do Blacks.

0 1 2 3 4

6. You have observed situations where other Blacks were treated harshly or unfairly by Whites/non-Blacks due to their race.

0 1 2 3 4

7. You have heard reports of White people/non-Blacks who have committed crimes, and in an effort to cover up their deeds falsely reported that a Black man was responsible for the crime.

0 1 2 3 4

8. You notice that the media plays up those stories that cast Blacks in negative ways (child abusers, rapists, muggers, etc.) [or as savages] usually accompanied by a large picture of a Black person looking angry or disturbed.

0 1 2 3 4

9. You have heard racist remarks or comments about Black people spoken with impunity by White public officials or other influential White people.

0 1 2 3 4

10. You have heard or seen other Black people express the desire to be White or to have White physical characteristics because they disliked being Black or thought it was ugly.

0 1 2 3 4

Vita

Benita P. Belvet was born in Fayetteville, NC on January 17, 1982. She is a citizen of the United States of America. She received a B.A. in psychology from the University of North Carolina at Chapel Hill in 2003, and a M.S. in psychology from Virginia Commonwealth University in 2009. She is currently pursuing a doctoral degree in counseling psychology at Virginia Commonwealth University. She has co-authored a peer-reviewed journal article titled “Influence of cultural orientation, ego resilience, and optimism on the subjective well-being of African Americans,” published in the *Journal of Positive Psychology* in 2008. She has also co-authored two edited book chapters on the topics of multicultural counseling and the psychometric measurement of African-centered psychological constructs.