Unpacking Racial Discrimination: An Examination of the Processes and Consequences Involved in the Experience of Racial Discrimination

by

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Dedication

To my mom, dad, and grandma

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ABSTRACT

Racial discrimination is a common experience for many African Americans and has been implicated in the Black-White disparities in physical health outcomes. While it is clear that racial discrimination is linked to negative outcomes, the processes by which racial discrimination is linked to these outcomes is unclear. The dissertation uses a process-focused framework that focuses on interpretative and racial identity (attitudes about the meaning and significance of race) factors. Moreover, the dissertation examines how African Americans respond to an actual racial discrimination event across two days thereby allowing for the examination of how responses unfold over time.

African American women were recruited from a large public university in the Midwest. On day 1, the participants arrived at the laboratory and were treated as if they are intellectually inferior by a White or African American confederate. The participants then reported their emotions and had their heart rate and blood pressure activity monitored. The participants returned to the laboratory approximately 24 hours later to provide additional emotional and physiological data and report on their experiences with the event.

To test the relations among the key study variables, a series of univariate analysis of variance (ANOVA), ordinary linear regression, and moderated mediation models were estimated. The findings revealed that the African American women who experienced the event as being more race-related reported being more angry, tense, and depressed than those who experienced the event as being less race-related (or not at all). Moreover, individuals who reported being highly race central and who experienced the event as being less race-related (or

not at all) reported experiencing the most tension shortly after the unfair treatment and the most happiness on day 2. Finally, the findings suggest that the mechanisms by which causal attributions impact the emotional and physiological outcomes varied based on individuals' racial identity attitudes.

The study findings suggest that racial discrimination may be experienced more negatively than non-race-related stressors. Moreover, the findings suggest that the processes that explicate the link between racial discrimination experiences and its consequences are complex. The implications of the findings are discussed.

CHAPTER I: INTRODUCTION

Background

Although the health of Americans has improved due to social reforms, modern technology, and preventive medicine, there are widespread racial health disparities. Indeed, racial and ethnic minorities tend to have higher disease prevalence rates and lower disease survival rates than their White American counterparts, with the largest disparity generally existing between African Americans/Black Americans[1] and White Americans (http://www.americanprogress.org/issues/healthcare/news/2010/12/16/8762/fact-sheet-health-disparities-by-race-and-ethnicity/). In 2009, the overall death rate (per 100,000 people) for cardiovascular diseases was 281.4 for White males, 387.0 for African American/Black American males, 190.4 for White females, and 267.9 for African American/Black American females (American Heart Association, 2008). Moreover, African Americans/Black Americans have a shorter life expectancy from birth as compared to their White American counterparts. Specifically, White males can expect to live to 75.9 years of age and White females can expect to live to 80.8 years of age (http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_09.pdf). Conversely, African American/Black American males and females have a life expectancy of only 70.0 years and 76.8 years, respectively (http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_09.pdf).

[1] The term African American/Black American refers to people having origins in any of the Black racial groups of Africa, including those from the Caribbean islands. The statistics described in this chapter are based on Americans' racial identification on the United States Census.

Ultimately, the health of White Americans has improved significantly more than that of African Americans/Black Americans over the last several decades. In fact, the current overall death rate for African American/Black American individuals in the United States is equivalent to that of White Americans 30 years ago (Mays, Cochran, & Barnes, 2007; Williams & Jackson, 2005). As these disparities in health are unjust and avoidable, it is imperative that researchers and policy-makers strive toward eliminating them (Herbert, Sisk, & Howell, 2008).

In an attempt to reduce and eliminate the aforementioned racial disparities in health outcomes, many researchers have examined the biological, psychological, and social factors that may account for these discrepancies, with many arguing that genetically-based differences are no longer viable explanations. Additionally, racial differences in poverty and socioeconomic status (SES) do not fully explain these health disparities as they still persist when taking SES into account (Mays et al., 2007). According to Geronimus and colleagues, the premature health deterioration among African Americans/Black Americans is a result, in part, of marginalization in our race-conscious society and is evidenced across all socioeconomic levels (Geronimus, Hicken, Keene, & Bound, 2006). This marginalization potentially results in African Americans/Black Americans' greater exposure to stressful events (e.g., financial stressors, neighborhood violence, little access to parks and healthy food stores, etc.) than their White American counterparts (Sternthal, Slopen, & Williams, 2011).

In addition to the aforementioned stressful events, there is evidence that African Americans/Black Americans are comparatively much more likely to experience racial discrimination (Kessler Mickelson, & Williams, 1999; Williams, John, Oyserman, Sonnega, Mohammed, & Jackson, 2012). Indeed, institutional and structural forms of racism are mechanisms or means by which African Americans/Black Americans are disproportionately

represented in low SES groups (e.g., poor, working class, etc.). Examples of these forms of racial discrimination include unfair policies and practices in the realms of housing, labor markets, education, and the criminal justice system (Williams & Mohammed, 2009). Furthermore, African Americans/Black Americans report frequently experiencing interpersonal forms of racial discrimination in their everyday lives (Sellers & Shelton, 2003) whereas White Americans report infrequently experiencing interpersonal racial discrimination (Guyll, Matthews, & Bromberger, 2001; Kessler et al., 1999). Specifically, Kessler and colleagues found that 44.4 percent of White Americans reported that they never experience day-to-day discrimination whereas only 8.8 percent of African Americans/Black Americans reported that they never experience day-to-day discrimination (Kessler et al., 1999). The researchers also noted that over 60 percent of African Americans/Black Americans reported experiencing day-to-day perceived discrimination and primarily attributed these events to racial discrimination. Examples of these forms of racial discrimination include being ignored, overlooked, or given poor service; being unfairly denied an opportunity; being avoided in public settings; being treated as if inferior; and being falsely accused. Taken together, African Americans/Black Americans' more frequent experiences with race-related and non-race-related stressors may contribute to their relatively poor health outcomes and the aforementioned Black-White health disparities.

The notion that racial discrimination may contribute to the Black-White health disparities is of particular importance as many individuals believe that our society is a "post-racial" one – a society in which the boundaries of race have disappeared and racism is no longer an issue that plagues racial and ethnic minorities (Lum, 2009). This notion has become particularly widespread following the election and re-election of Barack Obama with some referring to this "post-racial" era as the "Obama era" (Lum, 2009). These individuals believe that the election of

an African American/Black president is an indication that opportunities for success and the achievement of the American Dream no longer vary along racial and ethnic lines. Moreover, social norms and anti-discrimination laws in the United States have resulted in a decrease in overt acts of interpersonal racial discrimination and the overt expression of racial prejudice. It is likely that this decrease has also influenced individuals' views with regard to race relations in the United States.

Still, many researchers interested in the experiences of racial and ethnic minorities challenge this concept of post-racialism (e.g., Feagin, 1991; Sue, Capodilupo, Torino, Bucceri, Holder, Nadalm, & Esquilin, 2007). Specifically, these individuals argue that the racial and ethnic disparities in health status as well as the existing disparities in educational attainment, income, and net worth suggest that our society is anything but "post-racial" (Lum, 2009). Moreover, the findings from numerous research studies reveal that African Americans/Black Americans continue to frequently report experiencing interpersonal instances in which they have been treated unfairly by another person because of their race (e.g., Banks, Kohn-Wood, & Spencer, 2006; Feagin, 1991; Kessler et al., 1999; Sue, Capodilupo, & Holder, 2008; Sue et al., 2007). Collectively, the arguments and findings discussed here suggest that individuals' experiences in the United States are still very much tied to race.

The fact that there has been a decrease in overt acts of racial discrimination and the overt expression of racial prejudice coupled with the fact that African Americans still experience interpersonal racial discrimination begs the following question: What is the nature of the racial discrimination events that African Americans report experiencing in their day-to-day lives? According to several researchers and theorists, racial and ethnic minorities report most frequently experiencing racial hassles and microaggressions, the everyday experiences of

seemingly minor or commonplace mistreatment for which the causes or bases are neither clear nor objectively determined (Harrell, 2000; Sue et al., 2007). Moreover, these events often involve interactions with a White perpetrator in which this individual conveys rudeness and insensitivity and/or is demeaning (Sue et al., 2007). Furthermore, racial hassles and microaggressions are both common and pervasive. Evidence for the ubiquitous nature of these events can be found in empirical reports (e.g., Hoggard, Byrd, & Sellers, 2012; Kessler et al., 1999; Landrine & Klonoff, 1996; Sellers & Shelton, 2003) as well as in the narrative accounts of African Americans/Black Americans. For instance, a number of racial discrimination blogs can be found on www.microaggressions.com, a blog website devoted to providing a visual representation of the everyday forms of discrimination that racial/ethnic, gender, and sexual minorities experience. Most of the racial discrimination event descriptions reported by African American bloggers include statements that were overheard by or directed at the bloggers.

For example:

> *The ones breaking the school rules are always black people. The teachers don't do anything even when they see it happening because they are afraid. I think that I am being discriminated against because I'm white!*

Another blogger created the following blog:

> *You're really un-intimidating for a black guy.*

These statements are racist in that they convey that African American/Black American people are criminals, dangerous, intimidating, and deviant (Sue et al., 2007).

> *She's pretty for a Black girl.*

This statement is racist in that it conveys that African American/Black American people are ugly/unattractive and violate the beauty ideals of the majority.

> *Is there any way to make it so that ebonics shows up under the Google Translate button? I'm curious to know how black people interact with the site.*

Similarly, another blogger wrote,

> *White co-workers at a high-profile US government agency where I intern. They never say this to White interns. Before I did an interview for Newsweek, I was briefed and at the end, the examiner said,* ***"I was worried you would sound ghetto, but now I know you can communicate, so I have nothing to worry about."*** *I am 22 in Washington, DC. I was angry beyond words. It makes me sick that people still doubt my communication skills simply because I am Black.*

These statements are racist in that they convey that African American/Black American people are intellectually inferior and are incapable of speaking proper English.

> *How is it fair that some people can get scholarships for just being black? Where is my scholarship for being a hard-working person?*

This statement is racist in that it conveys that African American/Black American people are given extra unfair benefits just because of their race. The statement also suggests that African American/Black American individuals do not acquire these scholarships based on ability or merit (Sue et al., 2007). In summary, racial hassles and microaggressions, in their various forms, may be inescapable in the worlds of many African Americans/Black Americans (Banks et al., 2006; Feagin & Sikes, 1994).

Surprisingly, racial hassles and microaggressions are common in the college context, a place in which one would expect to potentially find more educated and tolerant individuals. An emerging truth is that African American/Black American students who attend Predominantly White institutions (PWIs) frequently experience racial discrimination, prejudice, and exclusion (e.g., Farrell & Jones, 1988). According to D'Augelli & Hershberger (1993), 41% of African American students reported occasionally hearing disparaging remarks about African Americans on their college campus, 28% reported hearing these disparaging remarks on their campus often,

and 20% reported hearing these disparaging remarks on their campus frequently (D'Augelli & Hershberger, 1993). Furthermore, 59% of the African American college students reported frequently being the target of racial insults at least once or twice on their campus (D'Augelli & Hershberger, 1993). Finally, 67% of the African American students reported that they feared for or worried about their safety on campus frequently (D'Augelli & Hershberger, 1993).

Given the frequency with which racial discrimination occurs at PWIs, it is critical to examine African American/Black American college students' experiences with these events. First, these experiences are likely to negatively impact African American/Black American students' psychological well-being and health outcomes as well as their academic success and retention. Moreover, African American/Black American college students are interesting to study. First, college is a time in which emerging adults juxtapose the beliefs they grew up with against new perspectives and the new ideas they encounter in the college environment (Arnett, 2000). Second, for some African Americans/Black Americans, attendance at PWIs is the first time that they have encountered a large number of White American individuals. As a result of being in this new context, these individuals may encounter new challenges and challenge their previously held beliefs around race relations. Third, understanding African American/Black American college students' experiences with racial discrimination can inform intervention work that can potentially help these individuals manage their emotional responses to and develop a repertoire of coping strategies for racial discrimination encounters that occur in the future.

Although the frequency with which racial hassles and microaggressions occur in the lives of African American/Black adults and college students may suggest that these experiences have trivial consequences, these events are costly to African Americans' overall psychological well-being and physical health outcomes (Banks, Singleton, & Kohn-Wood, 2008; Brondolo et al.,

2008; Guyll et al., 2001; Klonoff, Landrine, & Ullman, 1999; Krieger & Sydney, 1996; Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003; Sellers & Shelton, 2003). Specifically, these racial discrimination events have been linked to negative affect, poorer self-reported physical health and psychological well-being, and elevated blood pressure, heart rate, and cortisol (primary stress hormone) activity (Borrell, Kiefe, Williams, Diez-Roux, & Gordon-Larsen, 2006; Brondolo et al., 2008; Brown et al., 2000; Clark, Anderson, Clark, & Williams; 1999; Pascoe & Smart Richman, 2009; Seaton et al., 2008; Steffen, McNeilly, Anderson, & Sherwood, 2003).

While it is clear that racial discrimination is harmful, researchers are not clear with regard to whether the consequences of racial discrimination exceed those of non-race-related stressors. Similarly, researchers are not clear about whether an event will be experienced more negatively if it is perceived as being race-related than if it is perceived as being non-race-related. Making this determination is key if researchers are to determine whether racial discrimination is a unique stressor in the lives of African Americans/Black Americans and understand its impact in individuals' lives. Furthermore, researchers do not have a clear understanding of *how* racial discrimination may lead to deleterious outcomes. Specifically, researchers are not clear on the processes that are initiated or become activated in the moment when African Americans encounter racial discrimination incidents. Researchers speculate that experiencing a racially discriminatory event may set in motion a series of processes that result in negative emotional and physiological responses (Clark et al.,1999; Mays et al., 2007). These changes in the physiological systems include metabolic regulation, cardiovascular activity, blood pressure, and immune and inflammatory functioning (Harrell, Burford, Cage, Nelson, Shearon, Thompson, & Green, 2011; Pascoe & Smart Richman, 2009). Finally, few studies have investigated how African Americans' responses to racial discrimination unfold or evolve over time. Examining the

ways in which these responses unfold over time can shed light on how the initiated or activated processes and the changes in the physiological systems may eventually culminate in the deterioration of the bodily systems and contribute to disease and illness overtime (McEwen, 1998). Moreover, examining how individuals' responses to specific instances of racial discrimination may unfold over time may allow researchers to truly understand the impact of racial discrimination in the short term and for longer durations of time.

The Present Study

The dissertation will attempt to elucidate the processes that underlie the association between racial discrimination and its deleterious outcomes. Specifically, I will examine whether African American college students' emotional and physiological (heart rate and blood pressure) responses to a race-related stressor differ from their responses to a non-race-related stressor. Additionally, I will examine the ways in which these responses change or evolve over time. Finally, I will examine the various factors that potentially mediate or moderate the relationship between the stressors and African Americans' responses and whether these factors operate differently in the context of the race-related and non-race-related stressor. This examination will shed light on the underlying racial discrimination processes and probe the variability in African Americans' experiences with and responses to racial discrimination.

In the dissertation, I will conduct a study that employs a between-subjects, 2-session experimental design in which I will manipulate race-based cues in the laboratory. Specifically, participants will be treated as if they are intellectually inferior by a White Confederate or an African American/Black Confederate. Participants' emotional and physiological responses will be examined. I will also examine causal attributions of race-based discrimination, cognitive appraisals, rumination, and racial identity as factors that potentially underlie the association

between the stressors and the African American/Black American participants' emotional and physiological reactivity and recovery.

Emotional and Physiological Outcomes

I will assess African American/Black American participants' responses to the race-related and non-race-related stressors via self-reported affect and measures of cardiovascular activity using an electrocardiogram (ECG) and continuous blood pressure machine. These emotional and biological responses will be assessed before, during (heart rate and blood pressure), and after the stressor is experienced during the first session (day 1) so that reactivity (peaks) and recovery (length of time it takes to return to baseline) can be assessed. Additionally, I will assess participants' emotional and biological data during the second session (day 2). In doing so, I will be able to determine whether the participants' emotional, heart rate, and blood pressure responses to the race-related and non-race-related stressors differ from one another across both days. Collecting data at this additional time point may also allow me to better assess emotional and physiological recovery. Ultimately, the 2-day design will provide a clearer understanding of the impact of racial discrimination in the moment and over time.

Mediators

A potential variable that mediates the relationship between the racially discriminatory events that African Americans experience and their emotional and physiological responses to these events is causal attributions of race-based discrimination. A causal attribution has been defined as an explanation for why an event has occurred (Heider, 1958). If an African American, for example, has been overlooked or ignored by a White person, he or she may believe that the person did so for a number of different reasons. However, the African American <u>experiences</u> the event as racial discrimination, if and only if, he or she believes that the mistreatment was based

on race. Researchers have hypothesized that causal attributions influence individuals' affective reactions to racially-ambiguous events (Crocker & Major, 1989; Major, Quinton, McCoy, 2002). In this dissertation study, I will examine whether causal attributions of race-based discrimination mediate the relationship between race-based situational cues and emotional and physiological responses.

According to Lazarus and Folkman's stress and coping framework (1984), cognitive appraisals are important in understanding how individuals experience life events. A cognitive appraisal is an interpretive or evaluative process in which an individual assesses whether an event is self-relevant, whether he/she has something to lose, and whether he/she can deal with the event (Lazarus & Folkman, 1984). As cognitive appraisals have been found to predict how African Americans cope with stressful events (Smith & Dust, 1996), it may be reasonable to expect that cognitive appraisals will also have implications for how African Americans/Black Americans emotionally and physiologically respond to race-related events. In the dissertation study, I will examine whether cognitive appraisals mediate the relationship between race-based situational cues and African Americans' emotional and physiological responses to the event.

Finally, rumination likely bears theoretical importance in the context of racial discrimination. A common definition for rumination is having repetitive, intrusive, negative cognitions (Papageorgiou & Siegle, 2003). Rumination has been found to predict the tendency to become depressed, and to remain depressed for extended periods of time as the repetitive, intrusive, negative cognitions are usually reflected on the self (Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema & Jackson, 2001). As such, chronic or cumulative experiences of racial stressors may be a risk factor for negative mental health outcomes, particularly depression or depressive symptoms. More recently, researchers have found evidence

that rumination may be a primary mechanism by which prolonged physiological activation occurs after experiencing a stressor (Brosschot et al., 2006). This prolonged activation may then lead to somatic illness, particularly cardiovascular disease (Brosschot et al., 2006). Given that rumination, at least theoretically, leads to this prolonged activation, this dissertation will examine whether rumination mediates the relationship between the cognitive appraisal process and African Americans/Black Americans' emotional and physiological outcomes.

Moderator

Racial identity, in particular, has been found to be associated with African Americans' experiences with racial discrimination (Hoggard & Sellers, in prep; Operario & Fiske, 2001; Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003; Sellers & Shelton, 2003; Sellers, Linder, Martin, & Lewis, 2006; Shelton & Sellers, 2000) such that the importance of race, racial pride, and perceptions of how outgroup members view African Americans influence individuals' perceptions of and emotional responses to racial discrimination. For instance, racial importance has consistently been associated with a greater likelihood of perceiving that an event is race-based whereas perceiving that outgroup members view African Americans negatively has been found to buffer African Americans from the negative consequences of racial discrimination (e.g., Operario & Fiske, 2001; Sellers et al., 2006; Sellers & Shelton, 2003; Wong, Eccles, & Sameroff, 2002). Despite what is known about racial identity and race-related stress in the extant literature, I am not aware of any studies that have examined whether racial identity predicts African Americans' physiological responses to simulated real-life racial discrimination events that occur in the laboratory context. Attaining this understanding is important in elucidating how racial identity attitudes may impact or relate to physiological outcomes – not just psychological

outcomes – and potentially implicate health outcomes or health status. The present study will attempt to fill this gap in the existing research literature.

In sum, the present study will examine four research questions. First, do race-based situational cues and racial identity interact to predict causal attributions of race-based discrimination? Second, do causal attributions of race-based discrimination predict emotional and physiological reactivity and recovery, cognitive appraisals, and rumination? Third, do causal attributions of race-based discrimination and racial identity interact to predict emotional and physiological reactivity and recovery, cognitive appraisals, and rumination? Finally, are the relationships between the interplay of causal attributions of race-based discrimination and racial identity and the emotional, heart rate, and blood pressure outcomes mediated by cognitive appraisals (reactivity outcomes) and rumination (recovery outcomes)?

CHAPTER II: LITERATURE REVIEW

Chapter II of this dissertation reviews the racial discrimination literature. I begin by describing the nature of racial discrimination, describing the frequency with which racial discrimination occurs in African Americans' lives, and reviewing the link between racial discrimination and its various consequences. Then I present my theoretical frameworks for examining racial discrimination and the processes by which racial discrimination events may lead or contribute to negative outcomes. I conclude the chapter by discussing the limitations in the extant literature and presenting my research questions and hypotheses.

What is the Nature of Racial Discrimination?

Racial Discrimination Defined

Discrimination against African Americans has been one of the most serious forms of racial/ethnic discrimination in the United States (Feagin, 1991). Racial/ethnic discrimination or behavioral racism, as defined by Yetman, is "any act of an individual or institution that denies equitable treatment to an individual or a group because of phenotypic characteristics or ethnic group affiliation" (as cited Clark et al., 1999, p.805). Some theorists and researchers purport that the experiences of African Americans in the United States are unique from those of other oppressed groups (e.g., Sellers, Smith, Shelton, Rowley, & Chavous, 1998). Specifically, African Americans were involuntarily brought to the United States, enslaved, stripped of their culture, and treated as property for centuries. During the Jim Crow era following the abolition of slavery, African Americans were still deemed inferior. In fact, constitutional law legalized segregation

between African Americans and White Americans. In the twenty-first century United States, African Americans still face a number of inequalities in virtually all aspects of life. Indeed, African Americans/Black Americans are of poorer health status than their White counterparts and are victims of discrimination in housing, labor markets, and the educational, justice, and healthcare systems (e.g., Farrell & Jones, 1988; Williams & Mohammed, 2009; Williams, Yu, Jackson, & Anderson, 1997; Yinger, 1995).

In an attempt to eliminate institutional and blatant acts of racial discrimination, various laws and policies have been established. Despite the establishment of these laws and policies, structural and institutional forms of racial discrimination remain prevalent. Blatant forms of interpersonal racial discrimination, however, have become less frequent experiences in more recent decades for African Americans/Black Americans and other racial/ethnic minorities in the United States (e.g., Feagin, 1991). It important to note that this decrease by no mean implies that racial discrimination no longer plagues African Americans and other racial/ethnic minorities. Indeed, subtle and ambiguous race-related irritations or microstressors have become a structured part of racial/ethnic minorities' everyday experiences (Essed; 1991; Feagin, 1991; Harrell, 2000; Sue et al., 2007).

Racial Hassles/Microaggressions

African American/Black Americans and other racial/ethnic minorities frequently report experiencing racial hassles and microaggressions (Banks et al., 2006; Guyll et al., 2001; Harrell, 2000; Kessler et al., 1999; Lepore et al., 2006; Lewis et al., 2006; Solorzano, Ceja, & Yusso, 2000; Sue et al., 2007, Sue et al., 2008). Hassles are the "irritating, frustrating, distressing demands that, to some degree, characterize everyday transactions with the environment" (Kanner et al., 1981, p. 3). Racial hassles are the everyday or commonplace experiences of racial

discrimination for which there is a lack of clarity with regard to the cause or basis for the mistreatment (Harrell, 2000). Specifically, these racial discrimination events are characterized by subtle and ambiguous race-based situational cues and are therefore unclear with regard to why they occurred (i.e., race). Similarly, racial microaggressions have been defined as the automatic and often unintentional brief, commonplace, and daily verbal, behavioral, and environmental slights and indignities directed toward people of color (Solorzano et al., 2000; Sue et al., 2008; Sue et al., 2007). Sue and colleagues assert that there are three types of microaggressions: microassaults, microinsults, and microinvalidations (Sue et al., 2007; Sue et al., 2008). Microassaults have been described as hostile or overt racial incidents. Conversely, microinsults and microinvalidations have been classified as more ambiguous or subtle forms of racial microaggressions (Sue et al., 2007). Microinsults have been described as behavioral and verbal expressions that convey rudeness and insensitivity, and demean an individual's racial heritage and identity. Microinvalidations are acts of invalidating, negating, or diminishing psychological thoughts, feelings, and the racial reality of racial and ethnic minorities. In summary, racial hassles and microaggressions can be conceptualized as being: (1) race-based microstressors (as opposed to relatively infrequent major life events) that can occur on a weekly or even daily basis in the lives of many racial/ethnic minorities; and (2) ambiguous or subtle with regard to the explanations for why these events have occurred (Harrell, 2000).

As racial hassles and microaggressions are ambiguous with regard to causal attributions, individuals' explanation(s) for why an event has occurred (Heider, 1958), these events require that an attribution of race-based discrimination be made. In other words, a racial hassle or microaggression will only be experienced as racially discriminatory if and when a victim or target perceives that the event has occurred because of his/her race. Given the ambiguous and

subjective nature of racial hassles and microaggressions, it is important to adopt a phenomenological perspective – a perspective that rests on the individual's subjective interpretation of a transaction – when examining African Americans/Black Americans' experiences with subtle and ambiguous racial discrimination events (Harrell, 2000; Lazarus & Folkman, 1984; Sue et al., 2007).

What is the Frequency of Racial Discrimination in African Americans' Lives?

Racial hassles and microaggressions are seemingly ubiquitous in many racial/ethnic minorities' lives (Harrell, 2000; Sellers & Shelton, 2003; Sue et al., 2007). For instance, Lewis and colleagues (2006) examined 189 African American women's chronic experiences of everyday discrimination and found that approximately 86% of the participants reported "sometimes" or "often" experiencing at least one kind of hassle (i.e., being treated with less respect than other people, receiving poorer service than other people at restaurants or stores, being treated as if stupid, etc.) over the course of a year, every year for five years (Lewis et al., 2006). When prompted for causal attributions, 76.9% of the African American women cited race/ethnicity at least once during the five-year period.

In their investigation of the role that racial identity plays with regard to the antecedents and consequences of perceived racial discrimination, Sellers and Shelton (2003) assessed 267 African American college students' experiences with racial hassles using the Daily Life Experiences Scale (Harrell, 1994). Of the 18 racial hassles on the Daily Life Experiences Scale, participants reported experiencing a median of 14 hassles at least once during the past year (at Time 1) and a median of 13 hassles a year later (Time 2). On average, the African American college students reported experiencing 12.74 racial hassles at Time 1 and 12.47 at Time 2. Thirty-four participants (12% of the sample) reported experiencing all 18 of the incidents at least

once at Time 1 whereas 32 participants (12% of the sample) reported experiencing all 18 of the incidents at least once at Time 2. Interestingly, only 1 participant (0.4% of the sample) at Time 1 and 3 participants (1.1% of the sample) at Time 2 reported that they had not experienced any of the 18 racial hassles.

In a two-week daily diary study that examined African American college students' experiences with everyday forms of racism at a Predominantly White Institution (PWI), Swim and colleagues found that incidents of racial discrimination and prejudice were frequent (Swim, Hyers, Cohen, Fitzgerald, & Bylsma, 2003). Specifically, the majority of the African American participants (55%) reported one or two incidents that they rated as being probably or definitely prejudiced during the two-week period. Additionally, 10% of the African American participants reported experiencing three to seven incidents that were probably or definitely prejudiced (Swim, et al., 2003). Finally, Swim and colleagues found that participants reported an average of 0.51 incidents over the 2-week course of the study that they thought were "probably not prejudiced, but could be interpreted that way" and an average of 0.14 incidents that were labeled as "uncertain" (Swim et al., 2003, p. 50). According to the researchers, the participants – overall – were likely to experience about one incident a week, on average, after taking both the "probably" prejudiced and "definitely" prejudiced events into account (Swim et al., 2003).

Finally, in a more recent daily diary study that examined whether African Americans differ in their appraisals for and coping responses to racially stressful and non-racially stressful events, Hoggard and colleagues (2012) reported that approximately 23% of the participants in the larger diary study reported experiencing at least one racially stressful event during a 20-day period. While this proportion seems to suggest that experiencing racial discrimination is a somewhat rare event for these African American college students, an extrapolation of the 20-day

results across an entire year suggests that the participants should experience between 18 to 55 days in which they experience at least one racially stressful event. Taken together, the various findings provide support for the notion that racial hassles and microaggressions are structured parts of African Americans' lives. Indeed, these ambiguous, interpersonal forms of racial discrimination are very much a part of the everyday worlds of many African American adults and college students and occur in various contexts (i.e., in restaurants, on college campuses, etc.) (Banks et al., 2006; Feagin & Sikes, 1994).

What are the Consequences of Racial Discrimination?

Racial hassle and microaggression experiences have been associated with various negative psychological, physiological, and health outcomes (Clark et al., 1999; Paradies, 2006; Sellers & Shelton, 2003; Williams, Neighbors, & Jackson, 2003). In terms of psychological outcomes, racial discrimination researchers have largely focused on African Americans' emotional/affective, mental health, and well-being responses. Assessing these kinds of responses has several advantages, including: (1) Providing information about participants' immediate responses to events (i.e., emotional or affective outcomes); (2) Providing information about individuals' responses to events at the aggregate level as well as the downstream consequences of these cumulative events; and (3) Obtaining information directly from the individuals of interest with regard to their psychological state as opposed to making inferences about these individuals' psychological state based on objective data (e.g., physiological responses).

Researchers have traditionally utilized two approaches to study the relationship between race-related stress and psychological functioning[2]. The first approach utilizes a correlational design wherein researchers ask participants about their experiences with racial discrimination in their lifetime or in the past year (e.g., Harrell, 1994) and then link these experiences with participants' current reports on their psychological distress and well-being (e.g., Hall & Carter; 2006; Sellers & Shelton, 2003). For instance, in their review of the association between perceived racial discrimination and psychological and health outcomes, Williams and colleagues (2003) reported a consistent positive correlation between perceived racial discrimination experiences and psychological distress, depression, Generalized Anxiety Disorder (GAD), psychosis, anger, and substance abuse (Brown, Williams, Jackson, Neighbors, Torres, Sellers, & Brown, 2000; Guthrie, Young, Williams, Boyd, & Kintner, 2002; Kessler et al., 1999; Landrine & Klonoff, 1996; Landrine & Klonoff, 2000; Nazroo, 2002; Schulz, Williams, Israel, Parker, James, & Jackson, 2000; Siefert, Bowman, Helfin, Danzinger, & Williams, 2000; Whitbeck, Hoyt, McMoms, Chen, & Stubben, 2001; Williams et al.,1997; Williams & Chung, 1997; Yen, Rangland, Greiner, & Fisher, 1999). Consistent with the findings of the studies reviewed by Williams and colleagues (2003), Klonoff and colleagues found that racial discrimination was a powerful predictor of symptoms for anxiety, somatization, obsessive compulsive disorder, interpersonal sensitivity, and depression among Black Americans (Klonoff et al., 1999). Similarly, Gaylord-Harden and Cunningham (2009) reported that racial discrimination was positively associated with depression and anxiety among African American adolescents from

[2] More recently, several researchers have employed daily diary or ecological momentary assessment approaches to examine the relationship between race-related stress and psychological functioning. However, this approach will not be reviewed here.

low-income communities. Finally, Sellers and colleagues found that racial discrimination was associated with lower levels of psychological functioning, including perceived stress, depressive symptomatology, and psychological well-being, for African American adolescents (Sellers et al, 2006). Ultimately, racial discrimination is a noxious stressor in the lives of African Americans that negatively impacts mental health outcomes.

The second traditional approach to examining the relationship between race-related stress and psychological functioning involves experimental designs in which participants are exposed to race-related stressors via the use of films clips, imagined/hypothetical experiences, or guided imagery tasks (e.g., Armstead, Lawler, Gorden, Cross, & Gibbons, 1989; Fang & Myers, 2001; Lepore et al., 2006). For instance, Armstead and colleagues found that being exposed to racist film clips in the laboratory context was positively associated with anger among African American college students (Armstead et al., 1989). In another study, King (2005) examined the stress responses of African American female undergraduates who were presented with an audiotaped scenario wherein two White male peers evaluated them unfavorably. King (2005) found that the African American female undergraduates who made causal attributions of race-based discrimination for the negative evaluation experienced an increased stress response as measured by the Stress-Arousal Checklist and the Positive and Negative Affect Schedule. Conversely, the African American female undergraduates who made gender-based causal attributions did not experience a stress response (King, 2005). Collectively, the findings reviewed here suggest that racial discrimination that occurs in African Americans' real lives and race-related stressors that are created or contrived in the laboratory context trigger and are associated with negative emotional, well-being, and mental health outcomes.

In terms of physiological outcomes, researchers have often examined the link between African Americans' racial discrimination experiences and their autonomic nervous system (ANS) arousal/reactivity. The ANS is the branch of the nervous system that controls various involuntary functions, including heart rate, digestion, breathing, etc. Assessing ANS arousal/reactivity has several advantages over self-report approaches as it: (1) Allows for the examination of "online" moment-to-moment reactions to stressors or stimuli; (2) Is not susceptible to self-report biases; and (3) Can be linked to mental and physical health vulnerabilities thereby allowing researchers to link social contexts or dispositions to disease etiology or progression (Mendes, 2009).

Researchers have primarily utilized two approaches to study the relationship between race-related stress and ANS functioning (Salomon & Jagusztyn, 2008). The first approach utilizes an experimental design to examine whether African Americans exhibit exaggerated reactivity to race-related laboratory stressors and stimuli relative to stressors that are not race-related (Salomon & Jagusztyn, 2008). For example, Lepore and colleagues instructed African American and White women to imagine that they were giving a campus tour, experiencing a delay at an airport, and being accused of shoplifting in a store (Lepore et al., 2006). Their findings revealed that African American women exhibited greater cardiovascular reactivity to the shoplifting scenario relative to the other imagined scenarios. Moreover, only African American women exhibited cardiovascular reactivity to the shoplifting scenario. Finally, African American women attributing the shoplifting accusation to racial discrimination exhibited the greatest level of reactivity than any of the other participants in all of the conditions.

The second approach to studying the relationship between race-related stressors and ANS functioning utilizes correlational study designs that assess the association between self-reported

exposure to discrimination and blood pressure/heart rate levels among African Americans (e.g., Merritt, Bennett, Williams, Edwards, & Sollers, 2006; Steffen, McNeilly, Anderson, & Sherwood, 2003). Unlike the experimental studies that expose participants to an artificial or imagined laboratory stressor, these correlational studies examine the association between cardiovascular activity and real-life racial discrimination experiences as reported by the participants. Importantly, these correlational studies help determine whether the link between racial discrimination and cardiovascular reactivity actually exists in individuals' lives and beyond the laboratory. In one such study, researchers examined the association between participants' self-reported lifetime incidence of racially discriminatory events and systolic and diastolic ambulatory blood pressure (blood pressure as measured by a portable device) during participants' waking hours (Steffen et al., 2003). Steffen and colleagues reported that individuals who reported experiencing more racial discrimination exhibited higher waking ambulatory blood pressure than those who reported fewer incidents of racial discrimination (Steffen et al., 2003).

In addition to the psychological and physiological outcomes reviewed above, racial discrimination has been linked to various other cardiovascular and general health outcomes. For instance, in a review of population-based studies exploring the association between perceived racial discrimination and psychological and health outcomes, Williams et al. (2003) identified 6 studies that found a link between perceived racial discrimination and self-rated health (e.g., Schulz, Israel, Williams, Parker, Becker, & James, 2000; Williams et al., 1997), 8 studies that found a link between perceived racial discrimination and other self-report outcomes (e.g., Schulz et al., 2000), and 8 studies that found a link between perceived discrimination and other cardiovascular outcomes (e.g., Troxel, Matthews, Bromberger, & Sutton-Tyrrell, 2003). In their study, Troxel and colleagues examined the association between a composite index of stress that

included measures of life events, ongoing stress, discrimination, and economic hardship and subclinical carotid disease among 109 African American and 225 Caucasian premenopausal women (Troxel et al., 2003). The findings reveal that African American women who reported unfair treatment on the basis of race or ethnicity (i.e., racial discrimination) in their lifetime were at a marginally greater risk of having an arterial plaque score that was greater than or equal to 1 than the African American women who did not attribute their lifetime unfair treatment to race-related factors or who did not report experiencing unfair treatment in their lifetime at all (Troxel et al., 2003). Conversely, attributing mistreatment to race or ethnicity was unrelated to plaque buildup among the White women. These findings suggest that racial discrimination may be a particularly noxious stressor that potentially increases African American individuals' risk for cardiovascular disease although this does not seem to be the case for White Americans.

The findings from the review suggest that racial discrimination may contribute to cardiovascular disease and be associated with health status. In fact, a number of authors have argued that chronic experiences of racial discrimination throughout the life course are partially responsible for the Black-White racial disparities in cardiovascular health (Brondolo, Brady ver Halen, Pencile, Beatty, & Contrada, 2009; Clark et al. 1999; Mays et al., 2007; Paradies, 2006).

Understanding the Racial Discrimination Processes: Stress Theoretical Framework

Although chronic experiences with racial discrimination apparently have a number of wide-ranging, deleterious consequences for African Americans (Mays et al., 2007), the extant research literature lacks a critical understanding of the complexity of racial discrimination and how it is experienced by its victims (Essed, 1991). Specifically, researchers are unclear about the mechanisms or processes by which racial discrimination experiences may lead to negative psychological, physiological, and physical health problems.

In an attempt to understand the link between racial discrimination experiences and its negative consequences, a number of researchers have adopted stress theoretical frameworks (e.g., Clark et al., 1999; Outlaw, 1993; Sellers, Morgan, & Brown, 2001). Specifically, a number of researchers and theorists have conceptualized racial discrimination as a stressor and have built theoretical models for racial discrimination and/or have applied or modified broad models of stress to their examination of racial discrimination as a stressor (e.g., Clark et al., 1999; Harrell, 2000; Outlaw, 1993; Sellers et al., 2001). Lazarus and Folkman's transactional model of stress, appraisal, and coping has been most widely adopted in the conceptualization of racial discrimination (Lazarus & Folkman, 1984). Lazarus and Folkman define psychological stress as a "particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). Conceptualizing racial hassles and microaggressions within this framework has several advantages, especially linking it to the well-established research literature on stress and providing possible processes and mechanisms through which these events may be linked to psychological, physiological, and physical health outcomes. Furthermore, Lazarus and Folkman's stress, appraisal, and coping framework emphasizes the importance of the phenomenological perspective or approach (Lazarus & Folkman, 1984). According to this perspective or approach, individuals are actively involved in how they experience an event (Lazarus & Folkman, 1984). Specifically, individuals are exposed to an event, engage in cognitive processing in which they construe the event, and then respond or react to the event in a way that is consistent with their construal (Lazarus & Folkman, 1984). In summary, the phenomenological perspective focuses on the psychological experience of the individual encountering the event. Moreover, the phenomenological perspective recognizes the following:

(1) that events are not inherently stressful in and of themselves; (2) that potentially stressful events require that individuals interpret them as being stressful; and (3) that individuals' responses are determined by their interpretations (Lazarus & Folkman, 1984).

Although issues of prejudice, stigma, and stereotyping have long been areas of study within psychology, only in the last decade and a half have the perspectives of African Americans as targets of discrimination received considerable attention (Clark et al., 1999; Harrell, 2000; Swim, Cohen, & Hyers, 1998). To gain greater insight into the experience of contemporary forms of racism from the target's perspective, a phenomenological approach must be adopted in which the assessment or experience of the individual who is the target of the discrimination is viewed as determinant of whether an event is racially discriminatory (Essed, 1991). Adopting such an approach will potentially elucidate the mechanisms, processes, or pathways by which racial discrimination experiences may lead to negative psychological and physical health problems.

Interpretative Processes: Causal Attributions

Given the subjective and ambiguous nature of racial hassles and microaggressions, the causal attribution process is an important component of adopting a phenomenological approach to studying individuals' experiences with racial discrimination. Again, a causal attribution has been traditionally defined as an explanation for why an event has occurred (Heider, 1958). In the broader literature, the causal attribution process has received ample attention, with a particular focus on the ways in which individuals explain the negative events that happen to them. Despite the volume of research on the attribution process, there is disagreement with regard to whether the *kinds* of explanations or attributions for negative events matter and differentially mitigate or exacerbate an individual's psychological, physiological, and health outcomes. According to

some theorists, merely coming up with an explanation for an event confers benefits. Indeed, several researchers have found evidence that bereaved individuals who fail to make sense of their loss think about the loss more and recover less quickly than individuals who succeed at coming up with explanations (Bonanno et al., 2002; Davis, Nolen-Hoeksema, & Larson, 1998; Pennebaker, 1997; Silver, Boon, & Stones, 1983). Similarly, there is evidence that poorly understood events are likely to lead to intrusive thoughts as individuals will continue to think about these events until they come up with an explanation for why the event has occurred (Martin & Tesser, 1996; Wegner, 1994).

Conversely, others assert that above and beyond having an explanation, the kind of explanation matters (Wislon & Gilbert, 2008). According to Abramson, Seligman, and Teasdale (1978), making internal, stable, and global attributions leads to negative affect of greater intensity and duration than making external, unstable, and specific attributions. Similarly, attributing a bad grade to one's lack of ability will produce a more negative affective reaction than will attributing the same bad grade to the difficulty of the test (Wilson & Gilbert, 2008). In summary, these theorists argue that "all explanations are not equal" (Wilson & Gilbert, 2008, p. 375).

In the context of racial discrimination, researchers have hypothesized and speculated that an individual's explanation for why an ambiguous racially discriminatory stressor has occurred (e.g., race) will influence the individual's affective or emotional response to the stressor (Crocker & Major, 1989; Major et al., 2002). Specifically, it is possible that a racially-ambiguous event may lead to a more negative response for an African American who has made a race-based attribution than for an African American who has not made such an attribution (Hoggard & Sellers, in prep). Racial discrimination events may be particularly stressful or negative as African

Americans have a tragic history in the United States and racial discrimination experiences are dehumanizing. The present study will examine whether race examine whether an event is experienced more negatively if it is perceived as being race-related than if it is perceived as being non-race-related.

Interpretative Processes: Cognitive Appraisals

According to Mays and colleagues, "an examination of the role that cognitive appraisal and…play in race-based discrimination and health outcomes in African Americans may provide some useful insights into the pathways of the upstream/downstream discrimination and health relationship" (Mays et al., 2007, p. 213). Within their model, Lazarus and Folkman (1984) delineate two processes: cognitive appraisal and coping. Cognitive appraisal is an interpretative or evaluative process that consists of an individual determining whether s/he has something at stake in the encounter, and if so, to what extent the encounter exceeds the person's resources to cope. As an event is not stressful in itself, the appraisal determines whether an individual experiences a particular event as stressful. According to Lazarus and Folkman (1984), the appraisal process has two components: primary and secondary appraisal. Primary appraisal is the evaluation of whether an individual has something at stake in the encounter. According to Lazarus and Folkman (1984), the three kinds of primary appraisals are irrelevant, benign-positive, and stressful appraisals. An irrelevant primary appraisal is an evaluation that an event has no implication for the person's well-being. A benign-positive primary appraisal is an evaluation that the encounter outcome is or will be positive. Lastly, a stressful primary appraisal is an evaluation that an encounter will include a harm/loss (loss or harm has already occurred), threat (an anticipated harm or loss will occur), or challenge (there is an opportunity for a gain or benefit). A secondary appraisal is an evaluation of how taxing an encounter is or the extent to

which it exceeds the person's resources (Lazarus & Folkman, 1984). In other words, it is an evaluation of what, if anything, can be done to overcome or prevent harm or to improve the prospects for benefit. If an individual believes that he or she is prepared to manage or cope with the situation, the situation will most likely be appraised as a challenge and as non-taxing. Conversely, if the individual believes that he or she is not prepared to manage the situation, the situation will most likely be perceived as a threat (Lazarus & Folkman, 1984). Given the crucial role of cognitive appraisals in the experience of stressors, the present study will also examine the role of cognitive appraisals in the racial discrimination process.

There has been a growing body of literature that demonstrates that cognitive appraisals predict or are related to emotional outcomes (e.g., Lazarus & Folkman, 1984; Smith, Haynes, Lazarus, & Pope, 1993). Despite this growing body of evidence, the exact nature of this emotion-appraisal relationship remains unclear. One reason is that there has been disagreement with regard to the strength and nature of the appraisal-emotion relationship. Specifically, some researchers argue that the appraisal-emotion relationship is inconsistent and weak whereas others argue that the same sets of appraisals will consistently or reliably evoke the same specific emotions (Nezlek, Vansteelandt, Van Mechelen & Kuppens, 2008). Moreover, there is even disagreement with regard to which emotions map onto particular appraisals among scholars who purport that the same sets of appraisals will consistently evoke the same specific emotions. For instance, Lazarus & Folkman (1985) argued that threat appraisals evoke worry, fear and anxiety; challenge appraisals evoke confidence, hope, and eagerness; harm appraisals evoke sadness, anger, disappointment, guilt, and disgust; and benefit appraisals evoke exhilaration, pleasure, happiness, and relief. Conversely, others propose that confidence, pride, and anger are associated

with challenge states whereas shame, anxiety, avoidance, vigilance, and defeat are associated with threat states (Blascovich & Tomaka, 1996; Herrald & Tomaka, 2002; Mendes et al., 2008).

Another reason for the lack of clarity with regard to the exact nature of the emotion-appraisal relationship is that there are discrepancies in how cognitive appraisals and emotions have been or should be conceptualized and operationalized. Specifically, researchers have proposed different sets of appraisals (e.g., threat, challenge, loss/helplessness, self-blame, uncertainty, ambiguity, loss) that they believe to be related to emotions (Smith & Ellsworth, 1985; Smith & Lazarus, 1993; Tong, Ellsworth, & Bishop, 2009). Some researchers examine emotions at the specific level of discrete emotions (e.g., anger, sadness, happiness, anxiety, etc.) whereas others examine emotions at broader levels (i.e., positive vs. negative emotions; high arousal/activational vs. low arousal/inhibitional emotions; approach vs. avoidance/withdrawal emotions: Barrett, 2006; Herrald & Tomaka, 2002; Russell, Weiss, & Mendelsohn, 1989; Watson, Wiese, Vaidya, & Tellegen, 1999). According to Herrald and Tomaka (2002), emotions should be examined at the discrete level as discrete emotions may have distinct patterns of physiological responses and be associated with specific kinds of cognitive appraisals. For instance, the researchers found that both anger and shame were appraised as being demanding and threatening whereas pride was appraised as being low in demand and low in threat. Furthermore, researchers speculate that discrete emotions may be linked to specific health outcomes. For instance, anger has been linked to coronary heart disease whereas sadness has been linked to cancer and reduced immunological functioning (e.g., Booth-Kewley & Friedman, 1987; Irwin, Daniels, Smith, Bloom, & Weiner, 1987). The use of broader emotional dimensions, on the other hand, may be less sensitive to capturing such patterns and relationships. As a result of the variance in researchers' theoretical and methodological treatment of emotions and

appraisals, there is uncertainty with regard to how emotions map onto cognitive appraisals. In the present study, I will examine the role of the cognitive appraisal process in African Americans' specific emotional responses to a negative laboratory event.

In addition to the empirical support for the emotion-appraisal relationship, researchers have also found evidence of a physiology-appraisal relationship. In their biopsychosocial model of challenge and threat, Blascovich and Tomaka (1996) introduce a conceptual framework that integrates physiological arousal and cognitive appraisal theory. Specifically, the theorists propose that challenge and threat are motivational states that result from individuals' evaluations of their resources to cope in relation to situational demands. When individuals' personal resources exceed the situational demands of a situation that requires immediate attention or action – that is, when these individuals are *challenged* – they experience greater activation of the biological systems. This activation of the biological systems has been found to include increased heart rate, increased ventricular contractility, increased cardiac output (amount of blood that is ejected from the heart), and decreased vascular resistance so as to provide greater blood flow to the rest of the body (Blascovich & Tomaka, 1996; Herrald & Tomaka, 2002; Mendes, Blascovich, Lickel, & Hunter, 2002; Mendes et al., 2008; Tomaka, Blascovich, Kelsey, and Leitten, 1993). Conversely, when the demands of a situation that requires immediate attention or action exceed individuals' personal resources – that is, when these individuals are *threatened* – they experience increased heart rate, increased ventricular contractility, increased or stable cardiac output, and increased vascular resistance (Blascovich & Tomaka, 1996; Herrald & Tomaka, 2002; Mendes et al., 2002; Mendes et al., 2008). It has been proposed that increased vascular resistance is a *threat* response wherein the HPA axis inhibits the release of epinephrine and norepinephrine, leading to less efficient cardiac output.

Mendes and colleagues tested the biopsychosocial model of challenge and threat framework in the context of ingroup and outgroup rejection and acceptance among White and African American participants. Their findings reveal that African Americans were more likely to make causal attributions of race-based discrimination after experiencing social rejection by a White confederate as opposed to experiencing social acceptance by a White confederate (attributionally ambiguous condition). Furthermore, the African American participants were more likely to attribute feedback to discrimination when the evaluators were White than when the evaluators were African American. With regard to *challenge* and *threat* states, Mendes and colleagues found that African Americans who experienced rejection by a White confederate were more likely to be *challenged* (i.e., exhibited elevated heart rate responses, increased cardiac output, and decreased total peripheral resistance) than African Americans who were rejected by an African American confederate (Mendes et al., 2008). The researchers also found that African American individuals who were rejected by a White confederate also experienced more self-reported and nonverbal displays of anger than those who were rejected by an African American confederate. Finally, Mendes and colleagues found that African Americans who experienced acceptance by a White confederate were more likely to be *threatened* (i.e., decreased cardiac output and increased total peripheral resistance) than African Americans who experienced acceptance by an African American confederate. The African American participants who were accepted by a White confederate also reported experiencing less positive emotion and more vigilance (suspicion with regard to the positive evaluation made by the White confederate), consistent with a *threat* state (Mendes et al., 2008). It is important to note that Mendes and colleagues did not directly assess African Americans' cognitive appraisals in their study (Mendes et al., 2008). Instead, emotional and physiological responses were employed to infer *challenge*

and *appraisal* states. The present study will examine African Americans' self-reported cognitive appraisals as well as the relationships between appraisals and cardiovascular reactivity.

The Intersection of Causal Attribution and Cognitive Appraisal Processes

While cognitive appraisals and causal attributions are interdependent and are both independent determinants of an individual's interpretation of and emotional response to an event, cognitive appraisals have been proposed to mediate the relationship between an individuals' explanation for why an event has happened (attributions) and the individual's emotional response (Lazarus, 1995; Lazarus & Folkman, 1984; Smith et al., 1993). Specifically, attributions may influence an individual's appraisal of what is at stake such that making a causal attribution of race-based discrimination may lead a person to feel that more or less is at stake relative to a non-race-related causal attribution (Sellers, et al., 2001). Similarly, attributing a stressor to race-based discrimination may affect the individual's assessment of what, if anything, can be done about the stressor (Sellers et al., 2001). These appraisals will then predict emotional responses. Ultimately, causal attributions influence emotions by helping to define or make inferences concerning the perceived causes of a stressor whereas cognitive appraisals are evaluative and involve an individual's assessment of the relevance of attributions for personal well-being (Smith et al., 1993). It is important to note that the relationship between causal attributions of race-based discrimination and cognitive appraisals may exist in the context of physiological outcomes as well. More specifically, causal attributions may predict cognitive appraisals, which may, in turn, predict an individual's heart rate and blood pressure activity such that greater race-based attributions may lead to more stressful or negative appraisals, which may then lead to greater physiological activity.

The Role of Situational and Person-Related Factors

Finally, within their model, Lazarus and Folkman (1984) propose that potentially stressful events vary on a number of situational characteristics (i.e., duration, novelty, domain of life, etc.) and that these situational characteristics influence the ways in which individuals interpret and respond to events. Thus, there are situational differences in how any one individual interprets and responds to different events. Moreover, Lazarus and Folkman (1984) propose that potentially stressful events may be interpreted and responded to differently depending on the person-related characteristics (i.e., personality, coping resources, life experiences, etc.) of the individuals experiencing the events. Thus, there are person-related differences in how any single event is interpreted and responded to by many individuals. Furthermore, above and beyond the direct influences of the situational and person-related characteristics, the theorists argue that the interplay or transaction between situational and person-related characteristics predicts individuals' interpretations of and responses to events (Lazarus & Folkman, 1984). The present study will examine this interplay, specifically the interplay between race-based situational cues, the race of the perpetrator, and racial identity, the significance and meaning with regard to race (Sellers et al., 1998).

Understanding the Racial Discrimination Processes: Allostatic Load Framework

A number of researchers have also proposed allostatic load as a theoretical framework for explaining the processes, mechanisms, and pathways linking racial discrimination to adverse physical health outcomes (e.g., Harrell et al., 2011; Mays et al., 2007). Allostatic load is the "wear and tear" the body experiences after repeatedly adapting to stressors (McEwen & Seeman, 1999). This adaptation to stressors, called allostasis, involves the initiation of a set of physiological responses that mobilizes the individual to fight or flee. After the cessation of the

stressor, these biological responses to the stressor are then "shut off" thereby enabling the body to maintain homeostasis and return to its set points (McEwen & Seeman, 1999). While allostasis is adaptive in the short run, it is maladaptive or ineffective when chronic and/or excessive demands are placed on the body's regulatory systems. In other words, physiological responses become initiated in response to stressors but are not efficiently "shut off" once the stressor has ceased, leading to dysregulation of the various biological systems.

A primary biological system that is prone to dysregulation is the Sympathetic Adrenal Medullary Axis (SAM) (part of the ANS, more specifically the SNS – see SNS below). The SAM is a fast-acting system that involves the stimulation of the medulla of the adrenal glands that, in turn, secretes the catecholamines: epinephrine and norepinephrine (Kemeny, 2003). The secretion of these neurotransmitters then leads to increased blood pressure, increased heart rate, increased sweating, the constriction of the blood vessels, and various other changes in the sympathetic and parasympathetic nervous system branches of the ANS which, in turn, better prepare the individual to fight or flee (Kemeny, 2003). Over the long term, excessive secretion of the catecholamines can lead to suppressed immune functioning, increased blood pressure and risk for hypertension, increased heart rate and variations in normal heart rhythms (e.g., arrhythmia), and alterations in cholesterol levels which may then lead to build-up of carotid plaque and the development of atherosclerosis (Din-Dzietham et al., 2004; Troxel et al., 2003).

Consistent with the adoption of the allostatic load theoretical framework, researchers who examine how stress impacts health outcomes and health status have recently begun adopting a broad range of innovative methods that include indicators or components of allostatic load. One popular method is the measurement of heart rate (e.g., McEwen & Seeman, 1999). The heart functions to pump oxygenated blood throughout the body thereby mobilizing the body to fight or

flee in the face of threatening stimuli. Specifically, deoxygenated blood is pumped from the right pump of the heart (i.e., aorta and ventricle) to the lungs where it is oxygenated. Thereafter, the oxygenated blood is pumped from the lungs to the left pump of the heart (i.e., aorta and ventricle) and then from the left pump to the rest of the periphery (Stern, Ray, & Quigley, 2001). As the heart works, it produces an electrical signal that can be recorded at the surface of the skin via an electrocardiogram (ECG) (Blascovich, Vanman, Mendes, & Dickerson, 2011; Stern et al., 2001). This ECG measurement is then used to attain various measures of cardiovascular functioning. Heart rate, which refers to the number of times the heart beats per minute, is a common cardiovascular measure and is an important indication of ANS activity. Furthermore, cardiac activity is modulated by the ANS. The ANS is subdivided into an excitatory sympathetic nervous system (SNS) and an inhibitory parasympathetic nervous system (PNS) that operate antagonistically to control physiological arousal (Appelhans & Luecken, 2006). When encountering a psychological stressor, the activity of the SNS becomes dominant and produces a state of physiological arousal that initiates the fight-or-flight response. This state of physiological arousal is often characterized by increased heart rate (Appelhans & Luecken, 2006). Specifically, the catecholamines are released which then adjust the rate at which the heart beats. In doing so, the blood can be pumped more quickly from the heart to the periphery of the body and provide fuel for the muscles. During periods of relative safety and stability, the PNS is dominant and maintains a lower degree of physiological arousal, including decreased heart rate. As heart rate is responsive to affective states, allows for on-line responses to psychological stressors/stimuli, and has been linked to downstream physical illness (Mendes, 2009), measures of heart rate have been used in various studies that examine the correlates and consequences of racial discrimination (e.g., Armstead et al., 1989; Fang & Myers, 2001).

Another popular method that is used to examine the impact of stress on health outcomes or status is the measurement of blood pressure. This allostatic load indicator refers to the amount of pressure on the blood vessel walls during the cardiac cycle (Blascovich et al., 2011; Mendes, 2009). Specifically, contractions of the left ventricle of the heart produce the necessary pressure to move the oxygenated blood throughout the rest of the body (Stern et al., 2001). In the face of a stressor or threatening stimuli, the catecholamines are released, causing the blood vessels to constrict. The constriction of these blood vessels then causes an increase in pressure thereby allowing the oxygenated blood to be pumped more quickly throughout the body. The maximal, or systolic, blood pressure occurs during this period in which the left pump contracts and the blood vessels constrict (Blascovich et al., 2011; Stern et al., 2001). Following this period of contraction, the left pump relaxes, the blood vessels dilate, and blood pressure is at its minimum (Blascovich et al., 2011; Stern et al., 2001). This minimal blood pressure is referred to as diastolic blood pressure. Blood pressure can be measured in various ways although a popular and more recent technique is to assess blood pressure via a continuous blood pressure machine that measures blood pressure at the brachial artery of the upper arm (Blascovich, et al., 2011; Mendes, 2009). Using the recordings from blood pressure machines, blood pressure is reported as systolic blood pressure over diastolic blood pressure (SBP/DBP), as the weighted mean of systolic blood pressure and diastolic blood pressure (mean arterial blood pressure), or pulse pressure (P=SBP-DBP). As was the case with heart rate, blood pressure is sensitive to stressful and provocative situations, allows for on-line responses to psychological stressors/stimuli, and has been linked to physical illness (Mendes, 2009). As such, blood pressure has also been heavily used in the examination of racial discrimination and its correlates and consequences. Furthermore, experiencing racial discrimination has been identified as a potential

biopsychosocial risk factor that may account for the higher rates of hypertension observed in African Americans as compared to all other racial/ethnic groups (Anderson, Myers, Pickering, Jackson, 1989; Clark et al., 1999; Harrell, Hall, Taliaferro, 2003).

While physiological reactivity, or the magnitude of the physiological responses, is critical to the examination of the stress transaction between the person and the environment, it is also important to examine physiological recovery, that is, the length of time that it takes individuals to physiologically recover or return to baseline (or rest) after the termination or cessation of a stressful event. More specifically, examining recovery allows researchers to determine whether the biological responses that are initiated to respond to a stressor are shut off efficiently. Ultimately, the inability to recover from stressors quickly may be a marker for or an indication of the cumulative damage that stressful events may cause (McEwen & Seeman, 1999). In an attempt to elucidate the processes and mechanisms that potentially underlie the association between racial discrimination and its physiological and physical health outcomes, the present study will examine African Americans' reactivity and recovery responses to racial discrimination using heart rate and blood pressure as indicators of allostatic load. Moreover, the present study will examine emotional reactivity and recovery.

Rumination

In its examination of emotional and physiological recovery responses and adoption of the allostatic load framework, the present study will also examine rumination, or perseveration. Rumination has been defined as the tendency to have repetitive, intrusive, and negative cognitions (Papageorgiou & Siegle, 2003). Similarly, Nolen-Hoeksema, Wisco, and Lyubomisrky (2008) have defined rumination as the tendency to passively perseverate on negative feelings and problems. According to Brosschot and colleagues (2006), a central feature

of rumination and similar cognitive processes is perseverative cognition, the repeated or chronic activation of the cognitive representations of one or more psychological stressors (Brosschot et al., 2006). As a result of these cognitive representations, which exist after the cessation of a stressor, individuals may experience prolonged and repetitive appraisals of uncontrollability (Brosschot et al., 2006). Additionally, these individuals experience a prolonged state of emotional and physiological arousal and dysregulation (Brosschot et al., 2006). As a deviation from stress and coping models that tend to focus on the short term effects of stressors, Brosschot and colleagues proposed the Perseverative Cognition Hypothesis as a framework for examining the prolonging and exacerbating characteristics of perseverative cognition that mediate the link between psychosocial stressors and somatic illness (Brosschot et al., 2006). According to Brosschot and colleagues, rumination and "other perseverative cognitive phenomena" serve as the critical mechanism by which stressors have an impact on the development of chronic illness (Brosschot et al., 2006, p. 114). These theorists also argue that prolonged emotional and autonomic responses to a stressor only occur when prolonged representation of the stressor occurs. Importantly, the Perseverative Cognition Hypothesis emphasizes the long-term, accumulative effects of psychosocial stressors on autonomic and neuroendocrinological activity instead of the effects on the acute and peak responses of the autonomic and neuroendocrinological systems. As such, the Perseverative Cognition Hypothesis is consistent with the allostatic load framework (Brosschot et al., 2006).

Rumination has been implicated in various mental health disorders and somatic illnesses. Specifically, rumination has been implicated in anxiety and depressive disorders such that perseveration among trait ruminators leads to a decreased sense of control and an increase in anxiety and depression (Brosschot et al., 2006). Moreover, there is evidence that state rumination

about anger-provoking situations and trait rumination prolongs blood pressure elevation that was caused by the situations (Chambers & Davidson, 2000; Friedman, Thayer, Borkovec, Tyrrell, Johnsen, & Colombo, 1993). Furthermore, in their examination of the relationships among salivary cortisol, rumination about a transgression, and emotions in an in-vivo study, McCullough, Orsulak, Brandon, and Akers (2007) found that when participants ruminated about an interpersonal, painful transgression to a degree that was greater than typical for them, they also experienced increases in cortisol (McCullough et al., 2007). The researchers also found that fear may mediate the rumination-cortisol association such that rumination leads to increased fear which, in turn, leads to increases in cortisol activity. These findings suggest that excessive rumination over a period of time may also lead to HPA axis regulation and that rumination may cause individuals to re-experience negative emotions of events which may, in turn, lead to increases in cortisol activity. Taken together, these findings, to an extent, suggest that perseverative cognition "may be the missing link in the relationship between psychosocial factors and the chronic pathogenic physiological state thought to be causally related to the development of disease" (Brosschot et al., 2006, p.122).

Although under-examined in the context of discrimination and stigma, rumination has potentially important implications for African Americans' experiences with racial discrimination. For instance, in one study, Hatzenbuehler, Nolen-Hoeksema, and Dovidio (2009) found that African American and lesbian/gay/bisexual individuals reported more depressive rumination – ruminating about depressive feelings – on days when they reported stigma-related stressors than on days for which they reported no stigma-related stressor. Additionally, the researchers found that depressive rumination mediated the association between stigma-related stress and negative mood. In another study, researchers found that ethnic minority participants who reported more

frequent perceived ethnic discrimination also reported engaging in more angry rumination (ruminating about anger) (Borders & Liang, 2011). Additionally, angry rumination mediated the relationship between perceived ethnic discrimination and emotional distress and aggression among ethnic minorities.

The findings from the studies reviewed above suggest that discrimination may involve a ruminative component such that some ethnic minorities who experience perceived discrimination or stigma may perseverate over these events and then experience distress and negative emotions. Moreover, the findings suggest that the act of ruminating about negative emotions during or following the onset of a stressor (i.e., fear, anger, depression, etc.) may prolong the experience of negative emotions, moods, and distress. Given these findings, it may be reasonable to expect that rumination will also have implications for African Americans' perceptions of relatively ambiguous race-related stressors. Specifically, ruminating about the race-related stressor may result in perseveration over the causes or explanations for why the event happened and a greater likelihood of making attributions of race-based discrimination. This perseveration may then lead or contribute to greater emotional and physiological arousal and longer recovery periods, particularly among individuals who continue to think about the event as well as the negative emotions they experienced or are experiencing.

The Intersection of Stress and Allostatic Load Theoretical Frameworks

The present study will combine the stress, appraisal, and coping and allostatic load theoretical frameworks to examine how African Americans experience and respond to racial discrimination. In doing so, I propose that situational and person-related characteristics or factors interact to predict causal attributions of race-based discrimination. The causal attributions of race-based discrimination, in turn, predict individuals' emotional and physiological reactivity

and recovery responses. It is important to note, however, that the relationship between causal attributions of race-based discrimination and individuals' emotional and physiological reactivity will be mediated by the cognitive appraisal process. Moreover, I expect the relationship between causal attributions of race-based discrimination and individuals' emotional and physiological recovery to also be mediated by rumination or perseveration such that the cognitive appraisals will predict rumination which will, in turn, predict the recovery outcomes (see Figure 1).

Interplay between Situational and Person-related Factors and Causal Attributions

As theorized by Lazarus and Folkman (1984), situational characteristics are important determinants of how individuals experience potentially stressful events. Indeed, racial hassles and microaggressions are relatively ambiguous and therefore require that attention be paid to the signals in the environment that likely predict whether African Americans/Black Americans will experience such events as race-related. Specifically, these characteristics or cues may include objects, events, persons, or places that activate a particular social identity at a particular moment in time and may create the expectation that a person's treatment will be contingent upon one of his/her social identities (Purdie-Vaughns, Steele, Davies, Ditlmann, & Crosby, 2008). For instance, after attending to the number of African American/Black American individuals who are present in a particular context (e.g., no other African Americans/Black Americans present), an African American/Black American individual's racial membership may become salient. Thereafter, the individual may perceive that s/he will receive poor or unfair treatment (e.g., ostracism or rejection) on the basis of his/her racial group membership and thus may subsequently begin to feel threatened or anticipate that s/he will be harmed (e.g., emotionally, physically, etc.). In this instance, the situational cues or characteristics provided this individual with information regarding the extent to which his/her social identity would be devalued in the

particular context and lead him/her to appraise the situation as being threatening or potentially harmful. In other contexts, other social identities may be made salient, be perceived as valuable, and lead to evaluations that these contexts or spaces are non-threatening. Given the variability in how different situations and spaces can be experienced, it is important to attain a better understanding of situational characteristics that characterize contexts and elucidate the processes by which individuals assess and evaluate whether settings are threatening or non-threatening to their social identities and well-being (Purdie-Vaughns et al., 2008).

In their attempt to clarify the "formal" properties of situations that make them potentially threatening or harmful, Lazarus and Folkman proposed the following situational characteristics or cues: novelty, predictability, imminence, duration, temporal uncertainty, and *ambiguity* (Lazarus & Folkman, 1984, p. 82). *Ambiguity* is of particular interest in the present study as the focus is on racial hassles and microaggressions. *Ambiguity*, as defined by Lazarus and Folkman (1984), is the lack of clarity or sufficient information regarding the various situational characteristics (e.g., predictability, duration, etc.) that is necessary for an individual to assess the extent to which an event or context is threatening or harmful. In the context of racial hassles and microaggressions, *ambiguity* most commonly refers to the lack of clarity or sufficient information with regard to race-based situational cues – the prejudice-relevant signals in the environment or context that largely determine whether individuals will perceive that an event has occurred because of his/her racial or ethnic identity (Inman & Baron, 1996; Major, Quinton, & Schmader, 2003). Examples of race-based situational cues that have been studied include the race of the perpetrator, experimenter, or confederate (e.g., Morris-Prather, Harrell, Collins, Jeffries Leonard, Boss, & Lee, 1996; Shelton & Sellers, 2000) and the number of individuals who share a given identity in a particular context (Purdie-Vaughns et al., 2008).

When examining racial hassles and microaggressions, one can think of situational characteristics or cues as existing along a continuum ranging from no race-based cues to overt or blatant race-based cues. In situations in which there are no race-based cues, it is likely that few individuals, if any, will make race-based attributions. In other situations, race-based cues may be plentiful and blatant. In these instances, one would expect most African Americans/Black Americans to perceive that race is the basis for the mistreatment. For instance, it is likely that race will be salient for all or most African Americans/Black Americans sitting in a Klu Klux Klan meeting (Sellers et al., 1998). Finally, in situations in which race-based cues are few in number, are not blatant (subtle), or are mixed/contradictory with regard to their content (ambiguous), there will be variability in whether African American/Black American individuals will experience the event as being race-related. For instance, being the only African American in a White restaurant and receiving poor service may make race salient and be experienced as racial discrimination for some African American individuals but not for others. In these situations, individual factors will be particularly important. Indeed, when individuals encounter ambiguous events, they draw inferences based on their personal dispositions, beliefs, or past experiences. In fact, there is a positive relationship between ambiguity and individual factors such that greater ambiguity in situational cues or characteristics will lead to the greater importance of personal factors in the appraisal process and the experience of the event more broadly (Lazarus & Folkman, 1984). Subtle or ambiguous race-based situational cues exist in the middle of the no race-based cues to overt race-based cues continuum. In contrast to the situations in which there are either no race-based cues or overt or blatant race-based cues, ambiguous or subtle situations lack uniformity in individuals' perceptions.

Theoretical and empirical support for the relationship between race-based situational cues and race-based attributions has been increasingly documented (e.g., Hoggard & Sellers, in prep; Sellers et al., 2001; Shelton & Sellers, 2000). For instance, Hoggard and Sellers (in prep) conducted a study in which an African American participant is treated unfairly. Specifically, the experimenter denies the African American participant the opportunity to win an iPod and instead grants this opportunity to a confederate posing as a participant. In this study, there were two manipulations that resulted in three different conditions: no race-based cues, ambiguous/subtle race-based cues, and blatant race-based cues. The two manipulations were: 1) the race (African American or White) of the other participant (confederate); and 2) the absence or presence of the experimenter explicitly stating that he did not want to select the participant for the study because the participant was Black. The no race cue condition included an African American second participant and the absence of any statement by the experimenter as to why he did not select the participant. The ambiguous cue condition included a White second participant and the absence of any statement by the experimenter as to why he did not select the participant. The blatant cue condition also included a White second participant as well as a statement by the experimenter indicating that he did not select the participant because s/he is Black. The results reveal that the African American participants were more likely to view the event as race-related when in the blatant cue condition versus the ambiguous cue condition versus the no cue condition. Another important finding was that there were significant differences in attributional ambiguity across the conditions regarding the extent to which race was a factor. Fifty percent of the participants in the ambiguous cue condition reported that race was a factor in their unfair treatment. Conversely, no participants made attributions of race in the no race cue condition indicating that there was no attributional ambiguity. Finally, the blatant cue condition was characterized by less attributional

ambiguity than the ambiguous cue condition but more attributional ambiguity than the no race cue condition as 75% of the participants made race-based attributions. These findings suggest that the ways in which African Americans experience racial discrimination events is partially determined by race-based situational characteristics or cues, particularly the race of the confederate and the extent to which the event is blatant/overt or subtle and ambiguous.

As theorized by Lazarus and Folkman (1984), personal characteristics are also important determinants of how individuals experience potentially stressful events. One individual difference factor that has been found to be relevant in the context of African Americans' experiences with racial discrimination is racial identity. Racial identity has been defined as that part of a person's self-concept that is related to his or her membership within a race (Sellers et al., 1998). The Multidimensional Model of Racial Identity (MMRI) is the model of choice in the dissertation as it diverges from more stage-oriented approaches. Specifically, the MMRI is a status model wherein the focus is on an African American individual's racial identity at a given point in time (Sellers et al., 1998). Moreover, the MMRI provides a framework for the multi-faceted nature of racial identity and addresses both the significance or importance that an individual places on race as well as the meaning that is attached to one's membership in that racial group. Finally, the model makes no assumptions or value judgment with regard to what constitutes a healthy (e.g., feeling positively about being African American) or unhealthy (e.g., feeling negatively about being African American) racial identity. Instead, the theorists purport that certain racial identity attitudes may be associated with more positive outcomes than others depending on the context or environment (for a full review, see Sellers et al., 1998).

The MMRI proposes three stable aspects of African American racial identity. These stable dimensions are centrality, regard, and ideology. Racial centrality refers to the extent to

which a person normatively defines himself or herself with respect to race (Sellers et al., 1998). Racial regard refers to a person's affective and evaluative judgment of his or her race and is comprised of two sub-dimensions: private and public regard. Private regard refers to the extent to which an individual feels positively or negatively toward African Americans and his or her membership in that group. Conversely, public regard refers to the extent to which an individual feels that outgroup members view African Americans positively or negatively. Finally, racial ideology is the individual's set of beliefs, opinions, and attitudes with respect to the way he or she feels that members of his or her race should act (Sellers et al., 1998). The racial ideology dimension is comprised of four sub-dimensions: Humanist, Assimilationist, Minority, and Nationalist. Individuals with a strong Humanist ideology endorse that there are similarities among all humans, regardless of race. Individuals with a strong Assimilationist ideology endorse that there are similarities among all Americans and that African Americans should strive to be a part of mainstream society. Individuals with a Minority ideology emphasize that there are similarities between African Americans and other oppressed groups. Finally, individuals with a strong Nationalist ideology emphasize the uniqueness of being Black.

Various racial identity attitudes have been found to predict whether African Americans will experience an event as being race-related, particularly centrality and public regard. A common finding with regard to racial centrality is that there is a positive relationship between racial centrality and reports of racial discrimination. For instance, Sellers and Shelton (2003) found that racial centrality was positively associated with the frequency with which African Americans reported experiencing racial hassles in the past year. Similarly, researchers have found that there is a positive relationship between racial centrality and the likelihood of making causal attributions of race-based discrimination for stimuli or events that are presented or created

in the laboratory context. In their study, Shelton and Sellers (2000) instructed African American participants to read a vignette describing an incident in which an African American female student approached a professor for help in her academic studies. After the professor asks the student for her SAT scores and is told what they are, the professor responded that he could not help her. Moreover, the professor stated that he did not know why the student was admitted to the university because people like her did not do well there. The researchers manipulated the race of the professor (White or Black) such that those who read about the White professor were in the race salient situation whereas those who read about the Black professor were in the race ambiguous situation. Shelton and Sellers (2000) found that participants' racial centrality interacted with situational factors (i.e., race of the professor) to influence how the participants perceived or interpreted the event (Shelton & Sellers, 2000). Specifically, in the White professor situation, individual differences in racial centrality did not influence participants' attributions regarding the professor's ambiguous comments. Conversely, in the Black professor situation, individual differences in racial centrality did influence the attributions. Participants for whom race was an important part of their identity (high centrality) were more likely to attribute race to the Black professor's comments relative to individuals for whom race was less central to their identity (low centrality: Shelton & Sellers, 2000).

In their investigation of the relationship between ethnic identity and perceptions of prejudice, Operario and Fiske (2001) reported that ethnic identification was a predictor of ethnic minorities' perceptions of a subtle or ambiguous race-based stressor. Specifically, ethnic minorities who highly identified with their ethnic group were more likely to make causal attributions of race-based discrimination about the subtle or ambiguous behaviors of a White Confederate compared with ethnic minorities who identified less with their group.

A growing body of literature also suggests that public regard has implications for African Americans' experiences with racial discrimination. In their study, Sellers and colleagues examined the relationships among racial discrimination, racial identity, and psychological functioning among 314 African American adolescents (Sellers et al., 2006). Their findings reveal that the African American adolescents who believed that members of other groups view African Americans negatively were more likely to report experiencing racial discrimination in the past year than those who did not endorse that outgroup members view African Americans negatively (Sellers et al., 2006). These findings were corroborated in a study that was recently conducted by Hoggard and Sellers. In their unpublished manuscript, the researchers (Hoggard & Sellers, in prep) examined whether race-based situational cues interacted with aspects of racial identity to predict how African Americans experienced a laboratory event. As previously described, an African American participant entered the laboratory and was informed by the White male experimenter that he/she would view 3 visual stimuli and report his/her emotions. During the course of the experimental session, the participant was unfairly denied an opportunity to win an iPod by a White experimenter who either selected a White or African American second participant to win the iPod and who either made it explicit (i.e., first participant is Black and I do not want to choose him/her) or non-explicit about his reasons for selecting the second participant. The results reveal that there was a significant interaction between race-based situational cues and public regard. Specifically, public regard was meaningful only in the ambiguous cue and blatant cue conditions (not the no race cue condition) such that across both conditions, African Americans who believe that outgroup members view African Americans negatively were the most likely to make causal attributions of race-based discrimination.

The relationship between racial identity and individuals' tendency to make attributions of race-based discrimination has also been demonstrated using other models of racial identity. For instance, in their study, Jefferson and Caldwell (2002) instructed 92 African American participants to read hypothetical scenarios about White and African American characters who demonstrate racial biases against members of other racial groups (e.g., White character refusing to shop at Black businesses). The researchers also instructed participants to rate how biased they believed the characters were against the targeted racial group in the scenario and to complete the Black Racial Identity Attitudes Scale (RIAS), the measure that corresponds to Cross' Nigrescence theory. The findings reveal that individuals who reject the notion of racelessness and adopt pro-Black, anti-White attitudes were most likely to rate the White characters as being more racially biased and discriminatory than the African American character (Jefferson & Caldwell, 2002). Using the RIAS in another study, Hall and Carter (2006) examined the relationships among racial identity, ethnic identity, and past year and lifetime experiences of racial discrimination among Afro-Caribbean individuals. The researchers found that rejecting the notion of racelessness, the endorsement of pro-Black, anti-White attitudes, and immersion into Black culture were positively associated with racial discrimination experiences both in the past year and in the participants' lifetime.

Taken together, the findings from the various studies suggest that African Americans' attitudes with regard to the significance and meaning of race play a significant role in the extent to which African Americans make causal attributions of race-based discrimination for race-related events trans-situationally as well as at the level of the situation or event. Given the findings reviewed above, the present study will examine the importance of the situational

factors-personal related factors interplay as a determinant of African Americans' causal attributions of race-based discrimination for a negative laboratory event.

Causal Attributions and Outcomes

Currently, researchers are not clear with regard to whether racial discrimination is experienced similarly to or as fundamentally different from non-racially discriminatory stressors. According to Harrell (2000), experiences of racism go beyond, are qualitatively different from, and are perhaps more intense than nonracially discriminatory stressors. Similarly, Banks and colleagues (2006) assert that racial/ethnic discrimination is a unique psychosocial stressor or distinct life experience. Despite the theoretical assertion that racial discrimination events may be experienced more negatively or intensely than nonracial stressors, there is a need for empirical evidence or support. Furthermore, the little evidence that does exist is equivocal.

In their review, Brondolo and colleagues report evidence suggesting that experiencing racial discrimination may be more detrimental to African Americans than experiencing other stressful events (Brondolo, E., Rieppi, R., Kelly, K. P., & Gerin, 2003). They identified six lab studies comparing the cardiovascular activity of African American participants who were exposed to racist stimuli to that of African Americans who were exposed to similar anger-evoking, but non-racist stimuli. They report that of these six studies, four found evidence of elevated heart rate and blood pressure for the individuals who were exposed to racist stimuli as compared to those who were exposed to non-racist stimuli (Anderson, McNeilly, & Myers, 1992; Armstead et al., 1989; Guyll et al., 2001; McNeilly et al., 1995).

In addition to the four studies that Brondolo and colleagues identified as providing evidence that race-related stimuli lead to greater cardiovascular activity than non-race-related stimuli among African Americans, there are additional studies that lend further support for/to this

notion. For instance, Blascovich, Spencer, Quinn, and Steele (2001) examined the effects of stereotype threat, the phenomenon in which one is at risk of confirming, as self-characteristic, a negative stereotype about one's group (Steele & Aronson, 1995), on mean arterial blood pressure among African American and White participants. The researchers found that African Americans in the high stereotype threat condition exhibited larger increases in mean arterial blood pressure during an academic test and performed more poorly on difficult test items than White Americans and African Americans in the low or no stereotype threat condition (Blascovich et al., 2001). In this particular study, the race-related stressor or paradigm was experienced more negatively than the non-race-related racial stressor or paradigm.

In another study, Guyll and colleagues examined the association between mistreatment and blood pressure reactivity among African American and White Americans (Guyll et al., 2001). Specifically, the researchers found that participant reports of subtle forms of mistreatment were positively related to diastolic blood pressure among African American participants but not among the White participants (Guyll et al., 2001). Additionally, the African American women who attributed interpersonal mistreatment to racial discrimination exhibited greater diastolic pressure reactivity in general. These women also exhibited greater diastolic pressure reactivity following a speech task in which they had to imagine that they were being followed around in a department store but not following a mirror-tracing task (Guyll et al., 2001).

Further support can also be found in a study conducted by McNeilly and colleagues (McNeilly et al., 1995). In their examination of the relationship between racial discrimination and physiological activity, the researchers had participants partake in two debates with a Confederate: one race-related and one non-related (McNeilly et al., 1995). The researchers manipulated whether the Confederate provided social support for the African American

participant (no support vs. support). McNeilly and colleagues found that the participants experienced greater heart rate and blood pressure responses to the race-related debate than the non-race-related debate, regardless of the social support manipulation. Additionally, the participants who received no social support during the racial debate experienced the greatest anger reactivity.

In addition to the four studies suggesting differential physiological responses to racist stimuli in the review by Brondolo and colleagues (2003), the authors also reviewed two other studies in their review that found no differences in cardiovascular activity across the racist and non-racist stimuli conditions (Fang & Myers, 2001; Sutherland & Harrell, 1986). In the study conducted by Fang and Myers (2001), the researchers examined African American and White American males' responses to racially noxious and anger-provoking material and found that the African American males had similar cardiovascular responses to the racist and nonracist anger provoking film clips, suggesting that racial discrimination may not be a distinct stressor. There are also additional studies that lend support for the notion that race-related and non-race-related stimuli may not be experienced differently in terms of cardiovascular outcomes. In their examination of African American male and female participants' responses to race-related material that involved harassment by White and Black officers, Morris-Prather and colleagues found that the participants exhibited systolic and diastolic blood pressure increases as they viewed the scenes although there was no change in pulse rate (Morris-Prather et al., 1996). Interestingly, the race of the officers in the material did not predict physiological reactivity (Morris-Prather et al., 1996), suggesting that the race-related stressor was not experienced differently from the non-race-related stressor. Taken together, the findings regarding whether

race-related and non-race-related stressors are experienced differently are somewhat inconclusive.

In addition to being unclear with regard to whether racially discriminatory and non-racially discriminatory events are experienced differently, researchers are also unclear with regard to whether African Americans will respond to an event more negatively if it is experienced as being race-related than if it is not experienced as being race-related. In their examination of the consequences of experiencing racial discrimination, some researchers have argued that making causal attributions of race-based discrimination may lead to less negative outcomes than making a non-race-related causal attribution. Specifically, the researchers assert that attributing unfair treatment to racial discrimination is an act of externalizing unfair treatment to the prejudiced attitudes of the perpetrator instead of the personal faults or flaws of the target (Crocker & Major, 1989; Major et al., 2002). As such, this externalization may be protective of psychological well being, particularly self esteem. These assertions suggest that above and beyond explaining away a negative event, making causal attributions of race-based discrimination may result in an African American individual experiencing an event as being less personal and therefore less negative.

Conversely, others have found explicit support for the notion that the act of making a causal attribution of race-based discrimination may be associated with more negative outcomes. In a study conducted by Hoggard and Sellers (in prep), the researchers found that the 14 (50%) participants in the ambiguous cue condition who made causal attributions of race-based discrimination for their unfair treatment reported being more upset and distressed than the 16 participants in the ambiguous race cue condition who did not make causal attributions of race-based discrimination for the unfair treatment. Similarly, the 13 (75%) participants in the blatant

race cue condition who made causal attributions of race-based discrimination reported being more upset and distressed than the 6 participants in the blatant cue condition who did not make causal attributions of race-based discrimination for the unfair treatment. These findings suggest that experiencing the event as being race-related was not protective of the African American college students' emotional outcomes.

In another experimental study, King (2005) found that African American female undergraduates who were presented with an audiotaped scenario wherein two White male peers evaluated them unfavorably and who made causal attributions of race-based discrimination for the negative evaluation experienced an increased stress response. Conversely, the African American female undergraduates who were presented with the audiotaped scenario and who made gender-based causal attributions did not experience a stress response (King, 2005). These findings suggest that the *kinds* of explanations or attributions for negative events matter and may differentially mitigate or exacerbate individuals' responses to these events. Specifically, making causal attributions of race-based discrimination may lead to more negative responses than making non-race-related causal attributions.

Finally, Troxel and colleagues reported that African American women who reported experiencing unfair treatment on the basis of race or ethnicity (i.e., racial discrimination) in their lifetime were at a marginally greater risk of having an arterial plaque score that was greater than or equal to 1 than the African American women who did not attribute their lifetime unfair treatment to race-related factors or who did not report experiencing unfair treatment in their lifetime at all (Troxel et al., 2003). As discussed earlier, these findings suggest that experiencing chronic racial/ethnic discrimination may lead to a higher risk for cardiovascular disease than experiencing chronic non-race-related unfair treatment.

Taken together, the findings of the studies reviewed here suggest that a stressor may be experienced more negatively if it is experienced as being race-related than if it is not experienced as being race-related. Furthermore, the findings suggest that, for some African Americans, making a causal attribution of race-based discrimination may be associated with more negative outcomes than other kinds of causal attributions (e.g., gender). In order to reconcile the discrepancy between the study findings reviewed here and the assertions made by Crocker and other researchers (Crocker & Major, 1989; Major et al., 2002) with regard to the protective nature of making race-based attributions, it is important that researchers closely compare the psychological, physiological, and physical health outcomes of individuals who have explicitly attributed mistreatment to racial discrimination to those individuals who have not.

Causal Attributions and Cognitive Appraisals

Although the act of making a causal attribution of race-based discrimination has been linked with negative outcomes, this relationship is likely mediated by cognitive appraisals. Consistent with stress, appraisal, and coping theory and the biopsychosocial model of challenge and threat, cognitive appraisals (i.e., challenge, harm, threat, etc.) are key determinants in individuals' emotional and physiological responses to potentially stressful events. Moreover, the assertion that the cognitive appraisal process may be a key process or mechanism in the experience of racial discrimination is consistent with that of previous scholars wherein the scholars argue that race-related attributions may influence an individual's appraisal of what is at stake or the individuals' appraisal of what can be done relative to a non-race-related causal attribution (see above: Sellers, et al., 2001).

Causal Attributions and Rumination

Based on previous research (see rumination in Allostatic Load section above), experiences of discrimination and stigma are positively associated with rumination among racial and ethnic minorities (Border & Liang, 2011; Hatzenbuehler et al., 2009). Consistent with these study findings, the present study will examine whether causal attributions of race-based discrimination predict the African American participants' ruminative responses.

Interplay between Causal Attributions and Person-Related Factors Predicting Outcomes

As aforementioned, causal attributions have implications for how African Americans respond to race-related events. Moreover, racial identity has been found to implicate African Americans' responses to racial discrimination. For instance, Sellers and Shelton (2003) reported that public regard beliefs moderated the relationship between perceived discrimination and subsequent distress such that individuals who are low on public regard were buffered from the negative impact of perceived discrimination on distress levels. Similarly, Sellers and colleagues reported that low public regard individuals were buffered from the negative consequences of racial discrimination with regard to perceived stress and depressive symptoms although they were also more likely to experience events as being race-relevant (Sellers et al., 2006). Finally, Hoggard and Sellers (in prep) found that African Americans who are low on public regard were most at risk for experiencing negative emotions in the ambiguous race cue condition but were buffered in the blatant race cue condition. Together, these findings provide empirical support for the burgeoning theoretical work suggesting that aspects of racial identity may protect or buffer individuals from the psychological impact of race-relevant stressors in some contexts although not in others (Crocker & Major, 1989).

Surprisingly, relatively few studies have examined African Americans' physiological responses to personally experienced racially discriminatory stressors and their racial identity

attitudes. One notable exception is a study conducted by Neblett and Carter (2012) wherein the researchers examined the association among racial discrimination experiences in the past year as measured by the Daily Life Experience Scale (Harrell, 1994), racial identity clusters, Africentric worldview, and blood pressure among 210 African American young adults. Specifically, the researchers found that individuals who are low on public regard had the lowest diastolic blood pressure at high levels of racial discrimination. Moreover, the researchers found that racial identity moderated the relationship between racial discrimination and diastolic blood pressure such that there was a negative relationship between racial discrimination and diastolic blood pressure among individuals who are in the low public regard/nationalist (endorsement of the uniqueness of the African American experience) cluster (Neblett & Carter, 2012). Conversely, the relationship between racial discrimination and diastolic blood pressure was nonsignificant for individuals in the integrationist (strong endorsement that there are similarities among all humans while de-emphasizing the uniqueness of the African American experience) and race-focused cluster (highly race central, feel positively about being African American, perceive that others view African Americans positively, strongly endorse similarities among all Americans) (Neblett & Carter, 2012).

Other studies that have examined racial discrimination, racial identity, and physiology often examine African Americans' responses to imagined/hypothetical situations or racist stimuli such as film clips or have instructed participants to recall a race-relevant event that they previously experienced. For instance, Torres and Bowens (2000) examined the relationship between racial identity and African American students' physiological responses to stressful stimuli. Specifically, the researchers examined the relationship between racial identity, as measured by the Racial Identity Attitudes Survey-B (RIAS-B), and cardiovascular responses to

exposure to stressful stimuli among 17 African American students. In the laboratory context, the participants were instructed to complete three verbal tasks in which they recalled and described a frustrating event with racial overtones; described the furniture in their house; and completed a math task (Torres & Bowens, 2000). The researchers found that there was a significant positive correlation between Internalization, a racial identity status in which individuals are able to incorporate a self-confident and secure identity into his or her self-concept while also being able to recognize and appreciate other racial/ethnic groups (Cross, 1971; Cross, 1991), and systolic blood pressure during the racial stressor and math task. More specifically, a greater tendency to have an internalized Black racial identity is associated with greater systolic blood pressure during the recall of racial stressor and the math task. Conversely, there were no significant correlations between Internalization and pulse rate and diastolic blood pressure during any of the tasks.

Given the dearth of studies that have examined whether racial identity moderates the relationship between exposure to racial discrimination and physiological responses, the discrepancy in the findings of the few studies that have examined the association between racial discrimination and physiological responses, and the differences in the researchers' operationalization of racial identity, future studies should examine individuals' racial identity and its potential role in buffering or exacerbating the psychological and physiological impact of ambiguous racial stressors. The present study will attempt to do so by examining the interplay between causal attributions of race-based discrimination and racial identity. Specifically, I propose that African American individuals who make greater attributions of race-based discrimination and who are higher on racial centrality or lower are public regard will experience greater emotional and physiological reactivity and recovery.

Interplay between Causal Attributions and Person-Related Factors Predicting Cognitive Appraisals

The present study will examine the interplay between causal attributions of race-based discrimination and person-related factors (i.e., racial identity) as an important determinant of the cognitive appraisal process. In addition to theorizing on the relationship between causal attributions of race-based discrimination and cognitive appraisals in their book chapter, Sellers and colleagues also theorized about the role of racial identity in the primary and secondary cognitive appraisal process and the coping strategies that African Americans employ in the face of racial discrimination (Sellers et al., 2001). In terms of the primary cognitive appraisals, Sellers and colleagues theorized that racial centrality would predict primary appraisals such that individuals for whom race is central would be more likely to perceive that there is a great deal at stake after experiencing a race-relevant event than individuals for whom race is less central. In doing so, they argued that individuals who are highly race central will be more likely to appraise a race-related event as being one for which there is a great deal at stake than individuals who are not highly race central. Although Sellers and colleagues did not explicitly theorize about the relationship between public regard and primary appraisals, recent research suggests that African Americans who perceive that outgroup members view African Americans negatively are the most likely to make race-relevant attributions for racially ambiguous events (Hoggard & Sellers, in preparation). Given that these individuals are more likely to perceive that racism has occurred than individuals who perceive that outgroup members view African Americans positively, these individuals may also be more likely to perceive that they have a great deal at stake after experiencing racial discrimination, particularly racial hassles or microaggressions.

Additionally, Sellers and colleagues theorized about the relationship between the various racial identity dimensions of the MMRI and secondary cognitive appraisals (Sellers et al., 2001). Specifically, the researchers proposed that African Americans for whom race is central to the self-concept will likely be prepared to deal with racial discrimination (Sellers et al., 2001). Moreover, Sellers and colleagues argued that individuals who endorse that outgroup members view African Americans positively (high public regard) will likely be surprised by racial events and will therefore be unprepared to deal with them (Sellers et al., 2001). After taking into account the assertions of Sellers and colleagues (Sellers et al., 2001), the nature of racial hassles and microaggressions, and the findings of Hoggard and Sellers (in prep), I propose that African American individuals who make greater attributions of race-based discrimination and who are higher on racial centrality or are lower on public regard will appraise the laboratory event as being more negative or threatening/harmful.

Interplay between Causal Attributions and Person-Related Factors Predicting Rumination

The present study will also examine the interplay between causal attributions and personal-related factors (i.e., racial identity) as a determinant of rumination. Given that previous research has shown support for the association between experiencing an event as racial discrimination and the act of ruminating, it is also expected that this interplay will predict the extent to which African American individuals ruminate about the laboratory event. Specifically, I propose that African American individuals who make greater attributions of race-based discrimination and who are higher on racial centrality or lower are public regard will ruminate about the laboratory event more.

Interplay between Causal Attributions of Race-based Discrimination and Person-Related Factors, Cognitive Appraisals, Rumination, and Outcomes

As aforementioned, I propose that the interplay between causal attributions of race-based discrimination and racial identity will predict individuals' cognitive appraisals which will, in turn, predict emotional and physiological reactivity. Consistent with allostatic load theory and the Perseverative Cognition Hypothesis, I expect that prolonged stress responses will occur as a function of rumination or perseveration. Moreover, I expect that more negative or stressful appraisals will result in more rumination. As such, I propose that the interplay between causal attributions of race-based discrimination and racial identity will predict individuals' cognitive appraisals which will, in turn, predict rumination which will then predict emotional and physiological recovery (see Figure 1).

Limitations in the Extant Racial Discrimination Literature

While it is clear that racial discrimination is harmful to the psychological well-being, physiological functioning, and health of African Americans, there are a number of theoretical and methodological shortcomings in the extant research literature that limit our ability to understand *how* racial discrimination may lead or contribute to negative outcomes and the extent to which race-related stressors may be unique or distinct stressors in the lives of many African Americans.

One limitation of existing studies is the failure to examine the processes that explicate the link between racial discrimination and its negative outcomes. To date, many studies of racial discrimination characterize racial discrimination as a stressor to which African Americans have been exposed but fail to capture the underlying processes and factors. For example, many of the experimental studies on racial discrimination do not assess whether participants experience potentially race-related stimuli as being race-based. Instead, these researchers assume that the participants in the race-related stressor conditions are indeed experiencing the stressor as being

race-related. Given the variability in African Americans' experiences with or interpretations of racial discrimination events that occur both in real-life and in the laboratory (e.g., Hoggard & Sellers, in prep; Operario and Fiske, 2001; Sellers et al., 2001; Sellers & Shelton, 2003; Shelton & Sellers, 2000), not asking participants' about their interpretations of the laboratory stimuli will likely make it difficult to capture the psychological experience of racial discrimination and compare race-related and non-related stressors with regard to their consequences.

Moreover, the majority of studies that examine discrimination in the aggregate (i.e., lifetime or past year prevalence) and then link these aggregate racial discrimination encounters to important psychological (e.g., Jackson, Brown, Williams, Torres, Sellers, & Brown, 1996), physiological (e.g., Krieger, 1990), or health (Lewis et al., 2006) outcomes. Although these studies provide useful insight, they limit our ability to ascertain how specific discriminatory events may lead to negative outcomes. Moreover, stress, appraisal, and coping theory (Lazarus & Folkman, 1984) asserts that situational (e.g., race of the perpetrator) and person-related factors (e.g., racial identity) interact to influence interpretations of and responses to stressful situations. Relying solely on studies of aggregate racial discrimination events makes it difficult to understand how different individual and situational aspects of racially discriminatory events interact to influence psychological and physiological functioning. These studies collapse many different kinds of racial discrimination events and treat them as the same although they may be differentially linked to outcomes. Ultimately, the aggregate approach makes it difficult to capture differences in racial discrimination events and fails to probe the variability in African Americans' perceptions and responses to these events.

A second limitation of existing studies is that many studies do not examine actual experiences of racial discrimination. Specifically, many racial discrimination studies do not

create situations in the laboratory in which African Americans will actually experience racial discrimination themselves. Instead these studies employ designs that manipulate African Americans' *exposure* to race-related stressors via the use of films clips or imagined/hypothetical experiences. The use of film clips is not ideal as viewing racist film clips is not equivalent to actually experiencing racial discrimination. Folkman and Lazarus (1984) note that laboratory stressors do not reflect well the stressors that individuals experience in real life. Moreover, film clips are vicariously experienced through observation (Harrell, 2000). Using film clips is also problematic as some of the clips that the researchers present to participants are taken from popular films (e.g., Armstead et al., 1989). The use of these popular films may have increased the chance that participants had already seen the films and had the opportunity to emotionally distance themselves from the films prior to their study participation. If this were the case, we would expect to see attenuation in the reactivity to the stimuli (Fang & Myers, 2001). Ultimately, viewing racist stimuli may underestimate the effect of experienced racial discrimination and may not allow us to adequately capture whether race-related and non-race-related events are experienced differently.

Additionally, the use of imagined/hypothetical scenarios may not be ideal. For instance, Lepore and colleagues brought African American and White women into the laboratory to give three speeches: a control speech, a non-race-related speech, and a race-related speech (Lepore et al., 2006). Specifically, the participants imagined that they were giving a campus tour (control), experiencing delays at an airport (non-race-related stressor), and singled out in front of a crowd at an upscale store and accused of shoplifting (Lepore et al., 2006). The participants were instructed to act is if the situations were real and to describe the emotions and thoughts that they are having to a friend. The analyses revealed that African American women exhibited greater

cardiovascular reactivity to the shoplifting scenario relative to the imagined non-race-related stressors. Furthermore, only African American women exhibited cardiovascular reactivity to the shoplifting vignette with the African American women attributing the shoplifting accusation to racial discrimination exhibiting the greatest level of reactivity. Although the study conducted by Lepore and colleagues offers useful insight into the possibility that race-related stressors may be experienced from non-race-related stressors, it is a case in which participants' responses to hypothetical, ambiguous racial discrimination events are examined (Lepore et al., 2006). It has been argued that hypothetical scenarios require participants to report on emotions that they are not actually feeling (Lazarus, 1995; Robinson & Clore, 2001). Instead they are reporting their representations of emotions, not the emotions themselves, for scenarios that lack contextual details (Lazarus, 1995). Additionally, the researchers measured participants' cardiovascular responses to scenarios that did not elicit actual emotions and that lacked contextual details. Furthermore, the extent to which emotions that individuals actually experience correspond to hypothetical, prototypical emotions is unclear (Robinson & Clore, 2001; Smith & Ellsworth, 1987). Lepore and colleagues admit that their study "…may be a weak analogue to what happens in the real world" (Lepore et al., 2006, p. 126). Thusly, we are limited in the inferences that can be drawn from imagined race-related events and then generalized or applied to race-related events that are actually experienced.

To improve the ecological validity of the experimental designs that are currently being used to examine racial discrimination and its consequences, researchers may do well to employ scenarios that more closely approximate the everyday racial discrimination experiences that African Americans encounter (Salomon & Jagusztyn, 2008). As described above, Hoggard and Sellers (in prep) examined African Americans responses to a race-related and non-race-related

stressor in the laboratory via the manipulation of race-based cues to more closely approximate the everyday racial discrimination experiences that African Americans encounter. Specifically, the researchers manipulated the race of a confederate as well as the explicitness of the stressor, thereby creating a relatively real situation in the laboratory. The present study will utilize a design similar to that of Hoggard and Sellers (in prep) in which African Americans may experience a race-related stressor via the manipulation of the race of a Confederate.

Finally, a third, notable limitation of existing studies is the failure to examine how racial discrimination experiences unfold over time. Many studies examine racial discrimination at one time point, making it difficult to tease apart the causal order in the association between racial discrimination and its physiological or psychological consequences. While laboratory experimental studies may provide important clues to the factors that influence physiological and psychological responses to racial discrimination, these studies are also limited in their ability to elucidate the long-term effects of racial discrimination. For instance, physiological (e.g., cardiovascular reactivity) and psychological (e.g., rumination) responses to racial discrimination may continue to evolve once the participant has left the laboratory. One of the few models with an explicit focus on racial discrimination and health, Clark and colleagues' (1999) biopsychosocial model of racism, suggests that exaggerated psychological and physiological "fight or flight" processes are initiated when African Americans perceive that an event is racially discriminatory. McEwen and Seeman (1999) and others have noted that individuals' responses to a discriminatory event may take place long after the actual event; thus, it is critical that we examine individual differences in recovery, the length of time it takes individuals to "shut off" the "fight or flight" response, to truly understand how racial discrimination leads to "wear and tear" over time.

The Present Study

The goals of the present study are threefold: (1) to investigate whether race-related stressors are experienced differently than non-race-related stressors; (2) to examine the ways in which these responses unfold over time; and (3) to examine the processes and mechanisms (mediators and moderators) by which racial discrimination potentially leads or contributes to negative psychological and physical health outcomes. More specifically, the proposed dissertation study will examine how race-related and non-race-related stressors relate to psychological and physiological outcomes over a 2-day period. The proposed dissertation study is also concerned with causal attributions of race-based discrimination, cognitive appraisals, and rumination as key racial discrimination processes. Finally, the proposed dissertation study will examine situational factors and racial identity and their roles in the experience of racial discrimination.

The conceptual framework for the present study will combine stress, appraisal, and coping and allostatic load theory in the examination of African Americans' experiences with racial discrimination. A key assumption of the proposed investigation is the transaction between individual and situational factors and its influence on the way in which stressors are experienced. Specifically, African Americans' attributions and appraisals for racial discrimination events may be influenced by the interaction of individual difference factors such as racial identity as well as situational factors such as race-based cues. Another key assumption is that emotional and physiological responses must be assessed at multiple time points to assess the initiation of these responses as well as the amount of time that is required for these responses to cease.

As racial discrimination exists in many forms and has been operationalized in various ways, the primary focus of the proposed studies is the examination of African Americans'

experience with a relatively ambiguous/subtle and microstressor form of interpersonal racial discrimination in the laboratory. Specifically, the dissertation will examine African American college students' responses to being treated as if they are intellectually inferior by a White or African American/Black Confederate. Moreover, I assume that African American college students' identity as a college student is central to their self-concept and that the laboratory stressor will generally be appraised as being self-relevant. The dissertation will also attempt to build upon the limitations of previous studies by examining African Americans' perceptions of and responses to a single instance of racial discrimination that they have experienced in the laboratory. Care was taken to ensure that the event that the African Americans experience is ecologically valid.

In the present study, I argue that racial identity is an individual difference factor that influences whether African Americans will experience ambiguous racial discrimination events as being race-related. I also argue that the race of the perpetrator will determine whether African Americans experience an event as being race-related. As such, I examine whether the interplay of situational characteristics and racial identity interact to predict causal attributions of race-based discrimination. I also argue that causal attributions will predict emotional and physiological activity although this relationship will be moderated by racial identity. Moreover, I argue that cognitive appraisals will mediate the relationship between causal attributions of race-based discrimination and emotional and physiological responses and that the size of the effect will depend on African American's racial identity attitudes. Finally, I argue that rumination will mediate the relationship between cognitive appraisals and the emotional and physiological recovery outcomes. These relationships are depicted in Figure 1. Consistent with the stress, appraisal, and coping and allostatic load frameworks, the present study will examine the

magnitude of the change in the African Americans' emotional, heart rate, and blood pressure responses as well as the length of time that it takes them to return to baseline/resting emotional and physiological activity.

Given that African Americans' experiences with racial discrimination are gendered[3], the present study will examine how African American/Black female college students experience and respond to a race-related stressor that occurs in the laboratory. Females – not males – were included because there are many more African American/Black female undergraduates attending universities and colleges than there are African American/Black males.

Research Questions

1. Do race-based situational cues and racial identity interact to predict causal attributions of race-based discrimination?

2. Do causal attributions of race-based discrimination predict emotional and physiological reactivity and recovery, cognitive appraisals, and rumination?

3. Do causal attributions of race-based discrimination and racial identity interact to predict emotional and physiological reactivity and recovery, cognitive appraisals, and rumination?

4. Is the relationship between causal attributions of race-based discrimination and the emotional, heart rate, and blood pressure outcomes mediated by cognitive appraisals (reactivity outcomes)

[3] There is evidence that African American males may have more frequent experiences with racial discrimination (e.g., Bank et al., 2006; Sidanius & Veniegas, 2000; Sellers & Shelton, 2003). Moreover, study findings suggest that African American males and females may experience different *kinds* of racial discrimination events. Specifically, African American men seem to be more likely to be treated with fear and suspicion and to be overtly harassed whereas African American/Black women are often stereotyped as being hypersexual (e.g., "jezebel), nurturing (e.g., "Mammy") and sassy and aggressive (e.g., Sapphire) (Evans, 2011; Essed, 1991), and are more likely to be ignored in social, legal, political, and academic contexts (Purdie-Vaughns & Eibach, 2008). Finally, African American/Black women may be more vulnerable to the consequences and impact of racial discrimination (i.e., anxiety) (Banks et al., 2006; Greer, Laseter, & Asiamah, 2009).

and rumination (recovery outcomes) and are these proposed mechanisms moderated by racial identity?

Hypotheses

With regard to the first research question, I hypothesize that the interaction between race-based situational cues and racial identity will predict causal attributions of race-based discrimination. Specifically, I expect that African American individuals who are assigned to the condition in which they are treated as if they are intellectually inferior by the White Confederate and who are relatively high on racial centrality will be more likely to make race-based attributions than the African American individuals who are assigned to the condition in which they are treated as if they are intellectually inferior by the White Confederate and who are relatively low on racial centrality or who are assigned to the condition in which they are treated as if they are intellectually inferior by the African American Confederate and who are relatively high or low on racial centrality. Consistent with previous research that has shown that public regard is negatively related to reports of racial discrimination and the likelihood of experiencing a laboratory event as being race-related (e.g., Sellers & Shelton, 2003; Shelton & Sellers, 2000; Hoggard & Sellers, in prep), I expect that African American individuals assigned to the condition in which they are treated as if they are intellectually inferior by the White Confederate and who are low on public regard will be the most likely to make race-based attributions.

With regard to the second research question, I hypothesize that greater causal attributions of race-based discrimination will lead to greater emotional reactivity, heart rate reactivity, and blood pressure reactivity, with the logic being that race-related stressors may be experienced more negatively than non-race-related stressors. Similarly, I predict that greater causal attributions of race-based discrimination will lead to participants reporting the event as more

stressful and bothersome and that they have something to lose. Moreover, I expect that greater causal attributions of race-based discrimination will lead to more rumination or perseveration about the laboratory event. Specifically, I believe that experiencing an event as being more race-related will lead to more negative appraisals and hence will lead individuals to think about the event for longer periods of time. Finally, I expect that greater causal attributions of race-based discrimination will lead to longer emotional, heart rate, and blood pressure recovery periods, with the logic being that perseveration will extend the length of the stress responses.

With regard to the third research question, I hypothesize that the interaction between causal attributions of race-based discrimination and racial centrality will predict emotional reactivity such that individuals who make the greatest attributions of race-based discrimination and are highly race central will experience greater emotional reactivity than their counterparts. Moreover, I expect that the interaction between causal attributions of race-based discrimination and public regard will predict emotional reactivity such that individuals who make the greatest attributions of race-based discrimination and are low on public regard will experience greater emotional reactivity than their counterparts.

With regard to the physiological reactivity outcomes, I hypothesize that the interaction between causal attributions of race-based discrimination and racial centrality will predict heart rate and blood pressure reactivity such that individuals who make the greatest attributions of race-based discrimination and are high on racial centrality will experience greater heart rate and blood pressure reactivity than their counterparts. Moreover, I expect that the interaction between causal attributions of race-based discrimination and public regard will predict heart rate and blood pressure reactivity such that individuals who make the greatest attributions of race-based

discrimination and are low on public regard will experience greater heart rate and blood pressure reactivity than their counterparts.

With regard to cognitive appraisals, I hypothesize that the interaction between causal attributions of race-based discrimination and racial centrality will predict cognitive appraisals such that individuals who make the greatest attributions of race-based discrimination and are relatively high on racial centrality will appraise the event as being more stressful and bothersome and will report that they had something to lose than the individuals who are less likely to make attributions of race-based discrimination and are low on racial centrality and the individuals who are less likely to make attributions of race-based discrimination and are high or low on centrality. Moreover, I expect that the interaction between causal attributions of race-based discrimination and public regard will predict cognitive appraisals such that individuals who make the greatest attributions of race-based discrimination and are low on public regard will appraise the event as being more stressful and bothersome and will report that they had something to lose.

With regard to rumination, I hypothesize that the interaction between causal attributions of race-based discrimination and racial centrality will predict rumination or perseveration such that individuals who make the greatest attributions of race-based discrimination and are high on racial centrality will ruminate about the event more than their counterparts. Moreover, I expect that the interaction between causal attributions of race-based discrimination and public regard will predict rumination or perseveration such that individuals who make the greatest attributions of race-based discrimination and are low on public regard will ruminate about the event more than their counterparts.

With regard to emotional recovery, I hypothesize that the interaction between

Causal attributions of race-based discrimination and racial centrality will predict emotional recovery such that individuals who make the greatest attributions of race-based discrimination and are high on racial centrality will experience the longest emotional recovery periods. Moreover, I expect that the interplay between causal attributions of race-based discrimination and public regard will predict rumination or perseveration such that individuals who make the greatest attributions of race-based discrimination and are low on public regard will experience the longest emotional recovery periods.

Finally, with regard to physiological recovery, I hypothesize that the interplay between causal attributions of race-based discrimination and racial centrality will predict heart rate and blood pressure recovery such that individuals who make the greatest attributions of race-based discrimination and are high on racial centrality will have longer heart rate and blood pressure recovery periods. Moreover, I expect that the interplay between causal attributions of race-based discrimination and public regard will predict heart rate and blood pressure such that individuals who make the greatest attributions of race-based discrimination and are low on public regard will have longer heart rate and blood pressure recovery periods.

With regard to the fourth research question, I hypothesize that making greater causal attributions of race-based discrimination will predict cognitive appraisals which, in turn, will predict emotional reactivity. However, I hypothesize that this indirect effect will only be significant among African Americans who are highly race central or low on public regard. Specifically, I hypothesize that African American individuals who make greater attributions of race-based discrimination will be more likely to appraise the event as stressful and bothersome and indicate that they have more to lose than the individuals who are less likely to make attributions of race-based discrimination. These cognitive appraisals will then lead to greater

emotional reactivity. Moreover, I only expect this indirect effect to be significant for individuals for whom being African American is an important identity and for individuals who believe that outgroup members view African Americans negatively.

With regard to physiological activity, I hypothesize that making greater causal attributions of race-based discrimination will predict cognitive appraisals which, in turn, will predict physiological reactivity. However, I hypothesize that this indirect effect will only be significant among African Americans who are highly race central or low on public regard. Specifically, I hypothesize that African American individuals who make greater attributions of race-based discrimination will be more likely to appraise the event as stressful and bothersome and indicate that they had more to lose. These cognitive appraisals will then lead to greater heart rate and blood pressure reactivity. Moreover, I only expect this indirect effect to be significant for individuals for whom being African American is an important identity and for individuals who believe that outgroup members view African Americans negatively.

With regard to emotional recovery, I hypothesize that making greater causal attributions of race-based discrimination will predict cognitive appraisals which will, in turn, predict rumination which will then predict emotional recovery. However, I hypothesize that this indirect effect will only be significant among African Americans who are highly race central or low on public regard. Specifically, I hypothesize that African American individuals who make greater attributions of race-based discrimination will be more likely to appraise the event as stressful and bothersome and indicate that they had more to lose. These cognitive appraisals will then lead to greater rumination or perseveration, thereby extending the length of the stress response and leading to longer emotional recovery periods. Moreover, I only expect this indirect effect to be

significant for individuals for whom being African American is an important identity and for individuals who believe that outgroup members view African Americans negatively.

With regard to physiological recovery, I hypothesize that making greater causal attributions of race-based discrimination will predict cognitive appraisals which will, in turn, predict rumination which will then predict heart rate and blood pressure recovery. However, I hypothesize that this indirect effect will only be significant among African Americans who are highly race central or low on public regard. Specifically, I hypothesize that African American individuals who make greater attributions of race-based discrimination will be more likely to appraise the event as stressful and bothersome and indicate that they had more to lose. These cognitive appraisals will then lead to greater rumination or perseveration, thereby extending the length of the stress response and leading to longer heart rate and blood pressure recovery periods. Moreover, I only expect this indirect effect to be significant for individuals for whom being African American is an important identity and for individuals who believe that outgroup members view African Americans negatively.

CHAPTER III: METHOD

Participants

Forty one self-identified African American female college students[4] (M_{age}=19.80 years, *SD* = 2.11) were recruited at a large public university in the Midwest through the Office of the Registrar as well as through Black student organizations on the university campus[5]. Exclusionary criteria for the study were as follows: not being female; being less than 18 years of age; having participated in a study that was previously conducted in the laboratory; having major medical conditions (e.g., high or low blood pressure) or currently using medications for cardiovascular disease; currently being pregnant; and having a latex allergy (electrodes for the physiological systems are made of latex). Participants' mean self-reported grade point average (GPA) was 3.09 on a 4.0 scale (*SD*=3.8). Participants' class status ranged from freshman to fifth-year students with a total of 13 freshmen (32.50 %), 14 sophomores (35.00%), 9 juniors (22.50%), 2 seniors

[4] There is evidence that there are significant age variations in resting pulse rate (e.g., Ostchega, Porter, Hughes, Dillon, & Nwankwo, 2011). Given these age-based differences, I examined the correlation between age and baseline heart rate. Contrary to the aforementioned resting pulse rate trends, there was no significant correlation between age and baseline heart rate. A likely explanation is that there was little variance in the participants' ages. As was the case with pulse or heart rate, there is evidence of significant age-based variation in blood pressure (Stern, Ray, & Quigley, 2001). As such, I examined the correlations between age and baseline systolic blood pressure, diastolic blood pressure, and MAP. There were no significant correlations between age and baseline blood pressure either.

[5]Of the 5 individuals who learned about the study through their student organization on campus and were interested in participating, only one was eligible to participate. The remaining 4 participants were either allergic to latex (n=1) or had previously participated in the study (n=3). As such, only one study participant was recruited through Black student organizations on campus.

(5.00%), and 2 fifth year students (5.00%). The class standing for one participant is unknown. Participants earned $20 for their participation in the 2-session experiment.

Research Assistants

I trained nine African American and White female research assistants (3 experimenters, 6 confederates) to conduct the experiment. The research assistants were recruited at the large public university via flyers that were posted in the Department of Psychology or through a Psychology course that I taught during a previous semester.

Procedure

In the present study, the African American participant arrived at the laboratory and was greeted by a White experimenter. Spot electrodes and cuffs were applied to measure the participants' electrocardiogram (ECG) and blood pressure activity. After a baseline period, the participant completed a diary and an affect measure, and then sat still for a brief period so that her physiological activity could be recorded. The participant then interacted with a White or African American confederate who treated her as if she is intellectually inferior[6]. Twenty two participants were randomly assigned to the condition in which they interacted with the White confederate and 19 participants were randomly assigned to the condition in which they interacted with the African American confederate. After interacting with the confederate, the experimenter left the room. Upon the experimenter's return 5 minutes later, the participant completed additional diaries, completed the affect measure at two more time points so that changes in her

[6] Although females are the sample of choice, I took care to select a racial hassle or microaggression that is equally likely to be experienced by African American/Black females and males, thereby increasing the generalizability of the study findings. Being treated as if intellectually inferior was the race-related stressor of choice because there is evidence that African American/Black males and females are equally likely to experience unfair treatment in which their intellect was devalued (Evans, 2011). Moreover, data from a recent diary study that was conducted in our laboratory, the College Student Identity and Life Experiences Study, reveal that having one's intellect insulted was a frequent experience for African American college students relative to other kinds of race-related stressors.

emotions could be tracked, and provided additional physiological data. On the following day, the participant returned to the laboratory to provide additional physiological data, completed another diary and the affect measure, and answered questions regarding her interaction with the confederate on the previous day.

Day 1

Prior to Arrival. The participant was instructed to refrain from eating, drinking anything other than water, consuming caffeine, smoking, and engaging in physical activity (e.g., exercising, jogging, engaging in sexual intercourse) for an hour prior to each of her research appointments. Additionally, the participant was instructed to wear a tank top to both of her research appointments for ease of placement of the ECG spot electrodes and the upper arm cuff for the continuous blood pressure machine. If the participant forgot to wear/bring a tank top, she was asked to remove her shirt and was provided with a hospital gown to wear in the laboratory.

Arrival. After the participant arrived individually to the experimental room, the experimenter greeted the participant, introduced herself, and instructed the participant to sit down at a desk with a computer. Next, the experimenter reminded the participant that the experiment examines how the cardiovascular system – which includes the heart, blood, and blood vessels – respiratory, and emotional systems work together[7]. After the participant provided her informed consent, the experimenter applied the various spot electrodes needed to record the participant's ECG activity as well as the double finger cuff and upper arm cuff needed to record the participant's blood pressure activity.

[7]The larger study focuses on the African American college students' heart rate, blood pressure, cardiac output (amount of blood ejected from heart), and respiration responses to the laboratory insult. This dissertation focuses on the participants' heart rate and blood pressure responses.

Baseline. After being outfitted with the ECG spot electrodes and continuous blood pressure machine cuffs, the participant was instructed to sit for a quiet, 10-minute baseline period. After the baseline period, the participant was instructed to provide information about her compliance to study selection criteria (eating, drinking anything other than water, consuming caffeine, smoking, and engaging in physical activity for an hour prior to her research appointment) and demographic information (age, gender, race, year in school, and handedness)[8]. Thereafter, the participant was instructed to provide a description of her stream of thoughts and to provide information about her current affect.

Pre-Manipulation. After the baseline period, the participant was instructed to sit still for a quiet, 3-minute rest period so that her physiological activity could be recorded.

Manipulation. After the 3-minute rest period, a female (White or African American) confederate who was pretending to be another researcher knocked on the door and interrupted the experiment. After the experimenter steps out into the hallway, pulling the door closed behind her, the confederate explained that she was working on a study that examines techniques used to solve problem-solving tasks. Next, the confederate explained that her last participant failed to show up for the study, that she needed to finish collecting the data for the study by the end of the week, and that she was hoping that the experimenter would ask her participant to take part in the problem-solving tasks study. After reluctantly agreeing to help the confederate, the experimenter allowed the confederate to walk into the experimental room to invite the participant to take part in the problem-solving study. After looking at the participant, the confederate paused and said "oh…never mind". As the confederate walks out of the room, the experimenter follows the

[8] On day 1, two participants reported that they had consumed caffeine within an hour of their appointment. Moreover, one participant reported that she had engaged in physical activity within an hour of her appointment.

confederate back out into the hallway and asks, "What happened?" The confederate responds, "Well students have to have a high GPA to be eligible to participate, you know that is part of the criteria for the study, and she probably won't meet our standards so it's not worth it. But thanks anyway for your help." The confederate then leaves. The participant's physiological activity was recorded during the manipulation.

Spontaneous rumination. After the manipulation, the experimenter returned to the room and said "I am so sorry. That was really weird". Thereafter, the experimenter instructed the participant to sit still for another 3-minute rest period. The experimenter also explained that she forgot something in the other room and that she would go get it while the participant sat still for the 3-minute rest period. The experimenter then left the room, leaving the participant to spontaneously ruminate while sitting in the experimental room alone. The experimenter returned to the room 5 minutes later. The participant's physiological activity was recorded during this 5-minute period.

Post-Manipulation 1 time point. Upon the experimenter's return, the participant was instructed to provide a description of her stream of thoughts and to provide information about her affect. After reporting on her thoughts and affect, the participant was instructed to sit still for a quiet, 3-minute period so that her physiological activity could be recorded.

Post-Manipulation 2 time point. Immediately after the physiological rest period, the participant was instructed to provide another description of her stream of thoughts and to report on her affect. After reporting on her thoughts and affect, the participant was instructed to sit still for another quiet, 3-minute rest period so that her physiological activity could be recorded.

Day 2

Arrival. On the following day, the participant arrived for the second experimental session. As was the case on day 1, the experimenter greeted the participant and instructed the participant to sit down at the desk with the computer. The experimenter then applied the various spot electrodes needed to record the participant's ECG responses as well as the double finger cuff and upper arm cuff needed to record the participant's blood pressure activity.

Baseline. After being outfitted with the spot ECG electrodes and continuous blood pressure machine cuffs, the participant was instructed to sit for a quiet, 10-minute baseline period. After the baseline period, the participant was instructed to provide information about her compliance with the study instructions[9] (eating, drinking anything other than water, consuming caffeine, smoking, and engaging in physical activity for an hour prior to her research appointment), provided a description of her stream of thoughts, and reported on her affect.

Self-report. After the baseline period, the participant was instructed to think about her interaction with the other experimenter (confederate) on the previous day and her not being selected to participate in the problem-solving study. The participant was then instructed to answer various questions and to complete various measures with regard to the following: causal attributions, cognitive appraisals, rumination, racial identity, and manipulation checks.

Debriefing. At the end of the session on day 2, the experimenter removed the spot ECG electrodes and blood pressure cuffs. The experimenter then began the full debriefing process. Specifically, the participant was given the debriefing form and was verbally informed that the other experimenter who treated her as if she was intellectually inferior on the previous day was a confederate who was assisting with the study. The participant was also informed that there

[9] On day 1, one participant reported that she had engaged in physical activity within an hour of her appointment.

actually was no problem-solving study. Next, the participant was asked about her perceptions of the event, particularly, whether she was suspicious about the interaction with the other experimenter, whether the event was stressful and, if so, why it was stressful, and the extent to which she thought about the event after leaving the laboratory on day 1.

Apparatus

ECG. A Biopac (Goleta, CA) MP150 Acquisition System used in conjunction with the Bionomadix dual ECG-Respiration module was used to record ECG activity. The ECG recordings were obtained using a modified lead II configuration in which the spot electrodes were placed on the torso (negative lead on right sternum, ground lead on left sternum, and positive lead on the left side below the ribcage) of the participants (see Appendix A).

Blood pressure. A CNAP 500 continuous blood pressure monitor was used to continuously record participants' blood pressure. The blood pressure recordings were obtained using a continuously inflated double-finger cuff that was placed on the proximal joints of the index and middle fingers of the non-dominant hand (see Appendix B). Recordings were also obtained via an upper arm cuff that was placed above the brachial artery of the participants' non-dominant arm and that inflated at 30 minute intervals (see Appendix B). Participants were instructed to rest their non-dominant arm on the desk to ensure that their arm was at heart level (arm is below shoulder level but above the lowest rib). The blood pressure parameters of interest include systolic or maximal blood pressure (SBP), diastolic or minimal blood pressure (DBP), and mean arterial pressure (MAP)[10], the weighted mean of systolic and diastolic blood pressure: [(2 x DBP) + SBP]/3.

[10] MAP was automatically calculated by the CNAP 500 continuous blood pressure monitor.

Software. Acqknowledge 4.2 software was used to record and score the ECG and blood pressure data.

Measures

Affect. An affect scale was created by combining items from the Positive and Negative Affect Schedule (PANAS) and the Profile of Mood States (POMS) (PANAS: Watson & Clark, 1997; Watson, Clark, & Tellegen, 1988; POMS: McNair, Lorr, & Droppleman, 1992). The participants rated themselves on 20 items that assess several dimensions of affect: depression (unhappy, distressed, sad, and disappointed), anger (angry, upset, peeved, annoyed, resentful, and furious), tension (uneasy, anxious, scared, afraid, and nervous), and happiness (excited, enthusiastic, alert, inspired, and determined). The items were assessed on a 5-point Likert-type scale ranging from 1 *(very slightly or not at all)* to 5 *(extremely).* A higher score on each dimension is indicative of feeling more depressed, angry, tense, and happy. The Cronbach's alpha coefficients for the four subscales at each of the four time points (3 time points on day 1 and 1 time point on day 2) are as follows: depression (.74, .88, .91, and .70); anger (.77, .95, .95, and .88); happiness (.77, .66, .80, and .75); and tension (.55, .61, .73, and .72).

Causal Attributions. Participants provided causal attributions for being treated as if they are intellectually inferior. Prior to completing these causal attribution items, the participants were presented with the following prompt: "*As you may recall, an individual interrupted the experiment to inform the Experimenter (person conducting THIS experiment) that there was a problem-solving study and that she needed another person to participate in her study. This individual walked into the room, looked at you, and then decided that she did not need your help."* Participants then indicated the extent to which each of six attributions (random choice,

gender, competency, race, age, physical appearance, and social class) contributed to their not being selected to participate. A sample item is *"I was not invited to participate in the problem-solving study because of my race."* Responses were based on a 7-point Likert-type scale ranging from 1 *(strongly disagree)* to 7 *(strongly agree).* Participants' scores on the "my race" item were used to assess the extent to which participants experienced the situation as being a case of racial discrimination. A higher score on this item is indicative of more agreement that race was the reason for the unfair treatment.

Cognitive Appraisals. Participants completed three items that assess their cognitive appraisals of the event. The first item, *"How much were you bothered by the other researcher assuming that you do not have a high GPA?",* was assessed on a 4-point Likert-type scale ranging from 1 (*not bothered at all)* to 4 *(extremely bothered).* The second item, "*How stressful was the incident regarding your participation in the problem-solving study and your GPA?"* was assessed on a 4-point Likert-type scale ranging from 1 *(not at all stressful)* to 4 *(very stressful).* The third item, *"How much did you feel you had to lose in this situation"* was assessed on a 4-point Likert type scale ranging from 1 *(nothing)* to 4 *(a great deal).* A higher score on these three items is indicative of feeling more bothered, more stressed, and that there was more to lose in the situation, respectively.

State Rumination. On day 1, participants completed two stream of thought diaries (1 pre-manipulation and 1 post-manipulation) in which they wrote the thoughts that were flowing through their mind onto a sheet of paper (e.g., Kross & Ayduk, 2008). The post-manipulation diary was used to assess whether participants ruminated about the laboratory stressor. On day 2, participants completed another stream of thoughts diary. This diary was used to assess whether participants were still ruminating about the event from the previous day. Two independent

coders, unaware of the hypotheses, reviewed and coded the diaries for the absence (0) and presence (1) of rumination on day 1 and on day 2. Specifically, the coders were instructed to code for whether the participants had written anything about the interaction in the post-manipulation diary as well as in the day 2 diary. When there was disagreement between the coders, the coders reviewed the diaries together and reached a consensus. There was 90 % agreement among the coders (see Appendix C for coding scheme and participant diaries).

Participants also completed a Modified version of the Impact of Life Events scale (Horowitz, Wilner, & Alvarez, 1979) during the second session. The scale consisted of 15 items that assess the extent to which the participants had intrusive thoughts (α=.84) about the stressor over the last day and the extent to which they attempted to avoid these thoughts (α=.80). Responses to all items were assessed on a 4-point Likert-type scale ranging from 1 (*not at all*) to 4 (*often*).

Racial Identity. Participants completed the shortened version of the Multidimensional Inventory of Black Identity (MIBI-S), a 27-item questionnaire that assesses the three stable dimensions of the Multidimensional Model of Racial Identity: centrality, regard (private and public), and ideology (Sellers, Rowley, Chavous, Shelton, Smith, 1997). The present study focuses on the centrality and public regard scales. The centrality scale has 4 items (α=.83). An example of a centrality item is, "I have a strong attachment to other Black people." A higher score on the centrality scale is indicative of race being more important to an individual's self-concept. The public regard subscale has 4 items (α=.75). An example of a public regard item is, "Overall, Blacks are considered good by others." A higher score on the public regard scale is indicative of a belief that outgroup members have more positive feelings towards African Americans.

Demographics. Participants provided information about their age, gender, race, handedness, and year in school.

Manipulation Check Questions. Three items were presented to serve as manipulation checks. First, participants were asked whether they heard the conversation that took place out in the hallway. Second, participants were asked "what race did you assign to the other participant/researcher for the other study?" The response categories were: *1 (White), 2 (Black), 3(Asian/Pacific Islander), 4 (Hispanic/Latino), 5 (Biracial), and 6 (Other, please specify).* Finally, the participants were asked "what race did you assign to the Experimenter for THIS study?" The response categories were: *1 (White), 2 (Black), 3(Asian/Pacific Islander), 4 (Hispanic/Latino), 5 (Biracial).*

CHAPTER IV: RESULTS

This chapter presents the results of analyses conducted to examine the processes by which racial discrimination may lead to negative psychological and physiological outcomes. First, I present results regarding the interaction between race-based situational cues and racial identity predicting causal attributions of race-based discrimination. Next, I present the results regarding the relationships between causal attributions of race-based discrimination and emotional and physiological reactivity and recovery, cognitive appraisals, and rumination. I then present the results regarding the interplay between causal attributions of race-based discrimination and racial identity predicting the various outcomes. Finally, I present the findings with regard to whether the relationships between causal attributions of race-based discrimination and the emotional, heart rate, and blood pressure outcomes are mediated by cognitive appraisals (for reactivity outcomes) and rumination (for recovery outcomes), and whether these indirect effects are moderated by racial identity. In the first section, univariate statistics (means and standard deviations) for the study variables are presented. In the second section, intercorrelational relationships are presented. In the third section, the preliminary analyses are presented. In the fourth section, the results for each research question are presented.

Missing Data

Of the 41 recruited participants, 34 participated in the study across both days. Four participants did not participate in the study on day 2 because they experienced significant distress following the manipulation; one participant canceled her second appointment and never

rescheduled[11]; and one participant began to feel ill due to a non-reported medical condition at the beginning of the study on day 1. Moreover, various time points from the ECG and blood pressure data were missing because of loss of signal of the MP150 Acquisition System or recalibration of the CNAP 500 continuous blood pressure machine. This missing-ness will be reflected in the differing degrees of freedom.

Univariate Statistics

Univariate statistics related to grade point average (GPA) and racial identity are reported in Table 1.The statistics for causal attributions of race-based discrimination, cognitive appraisals, and rumination are reported in Tables 2-4. Finally, the statistics for the emotional and physiological outcomes are reported in Figures 2-9.

The African American college students generally reported moderately high levels of racial centrality (*M*= 5.69, *SD*= 1.13) and relatively low levels of public regard (*M*=3.57, *SD*=1.23). In other words, these individuals reported that race, to an extent, is an important part of their self- concept and that they believe that outgroup members view African Americans negatively (see Table 1). The African American college students also varied with regard to their GPA (*M*=3.10; *SD*=.38). Specifically, 12 participants reported having a GPA below 3.0, four participants reported having a GPA of 3.0, and 17 participants reported having a GPA above 3.0 (see Table 1).

Overall, the African American college students primarily attributed their being treated as if they are intellectually inferior to race (*M*=5.38, *SD*=1.85) (see Table 2), suggesting that they generally agreed that race was a factor. In addition to offering race as an explanation,

[11] This individual was debriefed and paid 4 days after her day 1 appointment.

participants also generally offered physical appearance as an explanation for the insult. Additionally, the college students experienced the laboratory event as being moderately bothersome (*M*=2.70, *SD*=1.15) and "a little" stressful (*M*=2.24, *SD*=.95). Conversely, the participants reported that they had little or nothing to lose in the situation (*M*=1.46, *SD*=.61). Overall, the self-reported cognitive appraisals indicate that the event was somewhat harmful or threatening (see Table 3). Despite reporting that the event was moderately bothersome and a little stressful, the African American participants reported not having or rarely having intrusive thoughts (*M*=1.62, *SD*=.66) about the event since its occurrence on the previous day. Moreover, the participants did not report trying to avoid thinking about event (*M*=1.76, *SD*=.68). For the "thought about it item", the participants reported thinking about the laboratory stressor very little (*M*=2.03, *SD*=.87) (see Table 4).

With regard to their emotional responses to the laboratory event, the African American participants reported experiencing more anger (*M* = 1.85, *SD*= 1.14) and depressive affect (*M* = 1.68, *SD*= .91) at the post-manipulation 1 time point on day 1, approximately 7-9 minutes after the manipulation, than at any other time point. In terms of tension, participants reported feeling more tension at baseline on day 1(*M* = 1.61, *SD*= .48) than at any other time point. In terms of happiness, participants reported feeling the happiest at baseline on day 1 (*M*= 2.33; *SD*= .75) (see Figures 2-5).

With regard to physiological outcomes, the African American participants exhibited the greatest heart rate activity during the baseline period on day 1 (*M* = 76.20, *SD*= 9.38), during the 10-minute period on day 2 (*M* = 75.19, *SD*= 9.88), and during the pre-manipulation time point (*M* = 74.31, *SD*= 8.51), respectively. Moreover, the participants had the highest systolic blood pressure (*M* = 142.22, *SD*= 26.20; *M* = 138.81, *SD*= 24.33; *M* = 138.50, *SD*= 2.89), diastolic

blood pressure (*M* = 93.93, *SD*= 13.81; *M* = 92.76, *SD*= 13.70; *M* = 90.86, *SD*= 13.04), and MAP (*M* = 110.04, *SD*= 17.26; *M* = 108.16, *SD*= 16.51; *M* = 106.75, *SD*= 15.19) at the post-manipulation 1 and post-manipulation 2 time points and at baseline, respectively. Participants' heart rate and blood pressure activity is also represented in Figures 6-9. A likely explanation for why the African American participants' heart rate activity was highest at baseline and why their blood pressure was relatively high at baseline is the novelty of the laboratory context and their apprehension about the physiological equipment. Specifically, many participants reported in their stream of thought diaries that they were anxious while being outfitted with the physiological equipment and for a brief of time thereafter. For instance, one participant stated the following: "My left hand is starting to feel tingly from the pressure that's on my finger". Another participant said "It feels very weird being hooked up to all of these wires". Finally, one participant wrote: "Hooked up to a lot of stuff".

In summary, the participants generally reported that race is central to their self concept and that they believe that members of other groups view African Americans negatively, and generally experienced the event as being racially discriminatory and threatening/harmful or negative.

Bivariate Statistics

Pearson's correlations were used to explore the bivariate relationships among the various variables.

Intercorrelations among causal attributions. There were weak to moderate correlations among several of the causal attribution variables. There was a marginally significant weak correlation between "race" and "physical appearance" (r=.30, p=.07), suggesting that participants perceived the two as being different. The "race" item was also negatively correlated

with the "random choice" item (r=-.42, p=.01), suggesting that the more they made causal attributions of race-based discrimination, the less likely they were to endorse that happenstance was an explanation (or vice versa). The "race" and "physical appearance" attribution variables were not correlated with the "competency" attribution variables (r=.10, p=ns; r=.24, p=ns). Not surprisingly, the "not sure" and "random choice" items were positively correlated with one another (r=.38, p=.02). These and additional correlations are presented in Table 5.

Intercorrelations among cognitive appraisal variables. There was a moderate positive correlation between the "bother" and "situation was stressful" variables (r=.57, p<.001). Conversely, the "bother" and "situation was stressful" variables were not correlated with the "something to lose" cognitive appraisal variable, respectively (r=.24, p=ns; r=.14, p=ns).

Intercorrelations among rumination variables. There was a weak positive correlation between the intrusion and avoidance subscales of the Impact of Life Events scale (r=.33, p=.05). Not surprisingly, there was a strong positive correlation between the extent to which participants had intrusive thoughts about the event, as measured by the Impact of Life Events Scale, and how much the participants directly reported thinking about the event (r=.77, p<.001). Finally, there was a moderate positive correlation between avoidance, as measured by the Impact of Life Events Scale, and how much participants thought about the event (r=.42, p=.009).

Intercorrelations among the emotional variables. There are weak to very strong correlations among the anger, depression, tension, and happiness subscales within and across the time points on day 1 and on day 2. These correlations are presented in Table 6.

Intercorrelations among the physiological variables. There are moderate to very strong positive correlations among the mean heart rate variables at the seven time points (day 1 and day 2). There are also weak to very strong positive correlations among the mean systolic, diastolic,

and MAP variables at the seven time points. Finally, there was only one significant correlation between the heart rate and blood pressure variables. Specifically, there was a moderate correlation between heart rate and MAP (r=.42, p<.05), on day 2 only. These correlations are presented in Tables 7-9.

Intercorrelations among racial identity subscales. There was no significant correlation between racial centrality and the extent to participants report that outgroup members view African Americans negatively (public regard) (r=-.24, p=.ns).

Preliminary Analyses

Condition Differences in Racial Identity

In order to determine whether the manipulation resulted in potential changes in racial identity attitudes and to verify that the random assignment was effective, A Multivariate Analysis of Variance was performed to determine whether there are condition differences in participants' racial identity. The two conditions did not differ with regard to racial centrality [F=(1,35)=.24, p= ns] or public regard [F=(1,35)=.17, p= ns], supporting previous research that racial centrality and public regard are stable (Sellers et al., 1998).

Condition Differences in Emotional Outcomes

Raw Scores

A series of Univariate Analyses of Variance were performed to examine the differences in participants' emotional outcomes[12] as a function of Race of the Confederate, controlling for

[12] Reactivity, defined as the magnitude of an individual's response to some stimulus, has often been assessed using raw scores and/or change scores. In this dissertation, data for raw scores and changes scores will be presented for the emotional and physiological outcomes.

their emotions at baseline. Surprisingly, the findings reveal that there were no significant differences in participants' depressive affect, anger, tension, and happiness reports at the two post-manipulation time points on day 1, based on Race of the Confederate (p=ns). However, a marginally significant difference in participants' anger scores emerged on day 2, controlling for anger at baseline, $F(1,34) = 3.00$, p=.09, η^2= .08. Specifically, participants in the White Confederate condition (M=1.27, SD=.47) reported being more angry than the participants in the African American confederate condition (M=1.04, SD=.15). There were no significant differences in participants' depression, tension, and happiness scores on day 2, based on Race of the Confederate (p=ns).

Change Scores

I then computed change scores for the various emotional outcomes. Specifically, variables were computed by subtracting the baseline emotional scores for each of the corresponding four subscales from the emotional scores at the post-manipulation 1 and post-manipulation 2 time points as well as the scores on day 2. In doing so, I was able to assess the extent to which participants' emotions changed relative to their baseline emotions on day 1. After performing various Univariate Analyses of Variance, I found that there was no difference with regard to participants' change scores at the post-manipulation time points on day 1 (p=ns). However, the findings suggest that there was a marginally significant difference in participants' Day 2-Day 1 Baseline anger scores, $F(1,35) = 3.67$, p=.06, η^2= .10. Specifically, participants in the White Confederate condition (M=-.008, SD=.58) experienced no change, on average, in anger from baseline on day 1 to day 2 whereas those in the African American confederate condition experienced, on average, a small decrease in anger from baseline on day 1 to day 2

(*M*=-.34, *SD*=.43). Although the difference between the conditions seems negligible, a posthoc power analysis suggests there is a medium effect size (Cohen's d=.33; power=.50). There were no significant findings with regard to the change in participants' other emotions.

Condition Differences in Heart Rate Outcomes

Raw Scores

A series of Univariate Analyses of Variance was performed to examine possible differences in participants' heart rate outcomes as a function of Race of the Confederate, controlling for heart rate activity at baseline. Surprisingly, the findings reveal that there was no significant difference in participants' heart rate at any of the post-manipulation time points on day 1 (*p*=ns). Interestingly, a significant difference emerged on day 2, controlling for baseline on day 1, such that the participants in the White confederate condition had greater heart rate activity, $F(1,29) = 5.82$, $p=.02$, $\eta^2= .17$. Specifically, these participants exhibited heart rate activity that exceeded that of the participants in the African American confederate condition by approximately seven beats per minute (M_{White}=77.80, *SD*=9.82; M_{AA}=70.72, *SD*=8.63).

Change Scores

I then computed change scores for heart rate activity by subtracting participants' heart rate at baseline on day 1 from their heart rate scores at each of the post-manipulation time points on day 1 and their heart rate scores on day 2. The results from the Univariate Analyses of Variance reveal that there was no Race of Participant Confederate difference with regard to participants' change scores at the post-manipulation time points on day 1 (*p*=ns). There was, however, a significant difference in participants' Day 2-Day 1 Baseline heart rate scores, $F(1,30) = 4.64$, $p=.04$, $\eta^2= .13$. Specifically, participants in the White confederate condition (*M*=2.11,

SD=10.24) exhibited heart rate activity that was, on average, about 2 beats per minute higher than their heart rate activity at baseline at day 1. Conversely, participants in the African American confederate condition exhibited heart rate activity that was, on average, about 5 beats per minute lower than their heart rate activity at baseline on day 1 (*M*=-5.15, *SD*=7.88).

Condition Differences in Blood Pressure Outcomes

Raw Scores

A series of Univariate Analysis of Variance was performed to examine the differences in participants' systolic, diastolic, and mean arterial pressure (MAP) blood pressure outcomes as a function of Race of the Confederate, controlling for blood pressure activity at baseline. With regard to systolic blood pressure, the results reveal that there were no significant condition differences during the induction [F=(1,30)=.37, p=ns], the 5-minute spontaneous rumination period [F=(1,30)=.08, p=ns], the post-manipulation 1 time point [F=(1,28)=.09, p=ns], the post-manipulation 2 time point [F=(1,29)=.50, p=ns], or on day 2 [F=(1,26)=1.13, p=ns].

With regard to diastolic blood pressure, the findings reveal that there was a marginally significant condition difference in diastolic blood pressure during the manipulation, controlling for diastolic blood pressure at baseline, $F(1,30) = 3.63$, $p=.07$, $\eta^2= .11$. Specifically, the participants in the White confederate condition had higher diastolic blood pressure than the participants in the African American confederate condition (M_{White}=91.37, *SD*=11.36; M_{AA}=87.52, *SD*=10.63). Moreover, there was a significant difference in participants' diastolic blood pressure during the 5-minute spontaneous rumination period that immediately followed the manipulation, controlling for baseline diastolic blood pressure, $F(1,30) = 4.53$, $p=.04$, $\eta^2= .13$. As was the case during the manipulation, the participants in the White confederate condition had

higher diastolic blood pressure than the participants in the African American confederate condition (M_{White}=91.53, *SD*=10.13; M_{AA}=86.67, *SD*=11.22). There were, however, no significant differences in diastolic blood pressure at the post-manipulation 1 [*F*=(1,28)=.03, *p*=ns] and post-manipulation 2 time points [*F*=(1,29)=.21, *p*=ns], or on day 2 [*F*=(1,27)=.69, *p*=ns].

Finally with regard to MAP, the findings reveal that there was a marginally significant difference in participants' MAP during the manipulation, controlling for baseline MAP, $F(1,30) = 3.86$, $p=.06$, $\eta^2= .11$. Specifically, the participants in the White confederate condition had higher MAP than the participants in the African American confederate condition (M_{White}=106.21, *SD*=16.04; M_{AA}=103.05, *SD*=11.78). Similarly, there was a marginally significant condition difference in MAP during the 5-minute spontaneous rumination period, $F(1,30) = 3.44$, $p=.07$, $\eta^2= .10$, such that the participants in the White confederate condition had higher MAP than the participants in the African American confederate condition (M_{White}=105.58, *SD*=14.93; M_{AA}=101.87, *SD*=12.51). There were, however, no significant differences in MAP at the post-manipulation 1 [*F*=(1,28)=.03, *p*=ns] and post-manipulation 2 time points [*F*=(1,29)=.59, *p*=ns], or on day 2 [*F*=(1,29)=.98, *p*=ns].

Change Scores

I then computed change scores for blood pressure (systolic, diastolic, and MAP) activity by subtracting participants' blood pressure at baseline on day 1 from their blood pressure scores at each of the post-manipulation time points on day 1 and their blood pressure scores on day 2. The results from the Univariate Analyses of Variance models reveal that there was no Race of Participant Confederate difference with regard to participants' systolic blood pressure change

scores during the manipulation [F=(1,31)=.65, p=ns], the 5-minute spontaneous rumination period [F=(1,31)=.13, p=ns], the post-manipulation 1[F=(1,29)=.08, p=ns] and post-manipulation 2 time point [F=(1,30)=.82, p=ns] time points, and on day 2 [F=(1,27)=.002, p=ns].

With regard to the diastolic blood pressure change scores, the results from the Univariate Analyses of Variance reveal that that there was no Race of Participant Confederate difference with regard to participants' diastolic blood pressure change scores during the manipulation [F=(1,31)=1.29, p=ns], the 5-minute spontaneous rumination period [F=(1,31)=1.48, p=ns], the post-manipulation 1 [F=(1,29)=.01, p=ns] and post-manipulation 2 [F=(1,30)=.48, p=ns] time points, and on day 2 [F=(1,28)=1.6, p=ns].

With regard to the MAP change scores, the results from the Univariate Analyses of Variance reveal that there was no Race of Participant Confederate difference with regard to participants' MAP changes scores during the manipulation [F=(1,31)=2.39, p=ns], the 5-minute spontaneous rumination period [F=(1,31)=1.73, p=ns], the post-manipulation 1[F=(1,29)=.01, p=ns] and post-manipulation 2 [F=(1,30)=.88, p=ns] time points, and on day 2 [F=(1,27)=.57, p=ns].

Condition Differences in Cognitive Appraisals

A Multivariate Analysis of Variance was performed to examine whether participants' cognitive appraisals varied as a function of Race of the Confederate. The findings reveal that there were no condition differences with regard to how bothersome [F=(1,35)=.51, p=ns], and stressful participants appraised the event [F=(1,35)=.02, p=ns], or participants' appraisals of what they had to lose [F=(1,35)=.003, p=ns].

Condition Differences in Rumination

Multivariate Analyses of Variance were performed to examine whether the extent to which participants ruminated about the laboratory event varied as a function of Race of the Confederate. The findings reveal that there were no condition differences with regard to avoidance [F=(1,35)=.32, p=ns], intrusive thoughts [F=(1,35)=.98, p=ns], or their direct reports of how much they thought about the event [F=(1,35)=.29, p=ns]. Moreover, there were no condition differences in the extent to which participants wrote about/discussed the interaction in their stream of thought diaries [F=(1,32)=1.54, p=ns; F=(1,32)=.69, p=ns].

Research Question 1

Do race-based situational cues and racial identity interact to predict causal attributions of race-based discrimination?

Before testing the moderation, I first examined the main effects for race-based situational cues and racial identity. A Univariate Analysis of Variance was performed to determine whether participants' interaction with the White or African American confederate significantly predicted their causal attributions of race-based discrimination. Surprisingly, there was no main effect of Race of Participant Confederate [F=(1,35)=.09, p=ns].Participants who were treated as if they are intellectually inferior by the African American confederate (M=5.50, SD=1.91) were just as likely to attribute the unfair treatment to race as the participants who were treated as if they are intellectually inferior by the White confederate (M=5.45, SD=1.74). Moreover, the participants who were treated as if they are intellectually inferior by the African American/Black confederate were just as likely to report that they had experienced racial discrimination in the laboratory

(M_{White} =2.23, *SD*= .81; $M_{AA/Black}$[13]=2.07; *SD*=.83) and that the Confederate is racist (M_{White} =4.82, *SD*= 1.74; $M_{AA/Black}$=3.93, SD= 1.77).

Next, I wanted to determine how many of the participants in each of the conditions made causal attributions of race-based discrimination. A dichotomous variable was created to differentiate those who believed that they were treated as if they are intellectually inferior because of race from those who did not make a race-based attribution. Individuals whose scores on the race-based causal attribution item ranged from 1 (*strongly disagree*) to 4 (*neutral*) were placed in the No Race Attribution group whereas those whose scores ranged from 5 (*somewhat agree*) to 7 (*strongly agree*) were placed in the Race Attribution group. Eighteen (81.80%) of the 22 individuals in the White Confederate condition were in the Race Attribution group and 4 were in the No Race Attribution group. Similarly, 10 (71.40%) of the 14 participants in the African American Confederate condition were in the Race Attribution group whereas 4 were in the No Race Attribution Group. Causal attribution data were missing for 6 individuals who do not come into the laboratory for day 2 of the experiment.

Next, an ordinary least squares regression was performed to investigate whether racial centrality predicted causal attributions of race-based discrimination. The findings reveal that there was no significant main effect for centrality (p=ns). I then tested the moderation. The findings reveal that there was no significant Race of Participant Confederate X Centrality interaction, b=1.01(.70), p=ns.

Finally, an ordinary least squares regression was performed to investigate whether there was a significant main effect for public regard. The findings show that there was no significant

[13] AA/Black refers to African American/Black.

main effect for public regard. I then tested the moderation and found that there was no significant Race of Participant Confederate X Public Regard interaction, *b*=-.44(.51), *p*=ns.

Research Question 2

Do causal attributions of race-based discrimination predict emotional and physiological reactivity and recovery, cognitive appraisals, and rumination?

Do causal attributions of race-based discrimination predict emotional reactivity?

Raw Scores

A series of ordinary least squares regressions was performed to investigate whether attributions of race-based discrimination predict participants' emotional responses following the manipulation. The first regression model tested whether attributions of race-based discrimination predict anger at the post-manipulation 1 time point on day 1[14], approximately 7-9 minutes after the manipulation, controlling for baseline anger. Specifically, the results reveal that participants who made greater attributions of race-based discrimination reported being angrier than the participants who were less likely to make race-based attributions or who did not make race-based attributions at all, *b* =.21(.08), *p* =.01. The model explained 19% of the variance in anger at this time point, $F(2,34)=3.98$, $p=.03$.

The second model tested whether attributions of race-based discrimination predict depressive affect at the post-manipulation 1 time point on day 1, approximately 7-9 minutes after the manipulation, controlling for baseline depressive affect. Specifically, the results reveal that participants who made greater attributions of race-based discrimination reported being more

[14] To assess emotional reactivity, I examined participants' outcomes at the post-manipulation 1 time point as well as the change in participants' outcomes from baseline to the post-manipulation 1 time point. To assess recovery, I examined participants' outcomes at the subsequent post-manipulation time points as well as on day 2.

depressed than the participants who were less likely to make race-based attributions or who did not make race-based attributions at all, b =.09(.04), p =.05. The model explained 42% of the variance in depressive affect at this time point, $F(2,34)=12.17$, $p<.001$.

The third model tested whether attributions of race-based discrimination predict tension at the post-manipulation 1 time point on day 1, approximately 7-9 minutes after the manipulation, controlling for baseline tension. The results show that participants who made greater attributions of race-based discrimination reported being marginally more tense than the participants who were less likely to make race-based attributions or who did not make race-based attributions at all, b =.06(.03), p =.07. The model explained 19% of the variance in tension at this time point, $F(2,34)=10.75$, $p<.001$.

Finally, the fourth model tested whether attributions of race-based discrimination predict happiness at the post-manipulation 1 time point on day 1, approximately 7-9 minutes after the manipulation, controlling for baseline happiness. Specifically, the findings reveal that causal attributions of race-based discrimination do not predict participants' happiness response, b=.05(.05), p=ns.

Change Scores

Next, ordinary least squares regressions were performed to determine whether causal attributions of race-based discrimination predict the change in participants' emotional scores from baseline to the post-manipulation 1 time point. The findings from the first model reveal that causal attributions of race-based discrimination predict the change in participants' anger scores such that participants who made greater attributions of race-based discrimination experienced larger changes in their anger scores pre-and-post manipulation than the participants who were less likely to make race-based attributions or who did not make race-based attributions at all, b

=.23(.08), p =.01. The model explained 20% of the variance in the change in anger, $F(1,35)$= 8.62, p=.01.

The findings from the second model reveal that causal attributions of race-based discrimination marginally predict change scores (post-manipulation 1-baseline) for depression. Specifically, participants who made greater attributions of race-based discrimination experienced larger changes in their depressive affect scores pre-and-post manipulation than the participants who were less likely to make race-based attributions or who did not make race-based attributions at all, b =.08(.05), p =.09. The model explained 8% of the variance in the change in depression, $F(1,35)$= 3.08, p=.09.

Similarly, the findings from the third model reveal that causal attributions of race-based discrimination predict the change in participants' tension scores from baseline to the post-manipulation 1 time point. Specifically, participants who made greater attributions of race-based discrimination experienced larger changes than the participants who were less likely to make race-based attributions or who did not make race-based attributions at all, b =.08(.04), p =.04. The model explained 12% of the variance in the change in tension, $F(1,35)$= 4.60, p=.04.

The findings from the fourth model reveal that causal attributions of race-based discrimination do not, however, predict happiness change scores, b =.06(.05), p =ns.

Do causal attributions of race-based discrimination predict emotional recovery?

Raw Scores

A series of ordinary least squares regressions were performed to test whether attributions of race-based discrimination predict emotional recovery. The first regression model tested whether attributions of race-based discrimination predict anger at the post-manipulation 2 time point on day 1, approximately 10-13 minutes after the manipulation, controlling for baseline. The

results reveal that participants who made greater attributions of race-based discrimination reported feeling angrier than the participants who were less likely to make race-based attributions or who did not make the attributions at all, b =.15(.06), p =.01. The model explained 19% of the variance in the race-based attributions, $F(2,34)=3.96$, p=.03.

Three other regression models were performed to test whether causal attributions of race-based discrimination predict depressive affect, tension, and happiness at the post-manipulation 2 time point on day 1. The findings reveal that causal attributions of race-based discrimination were unrelated to depression [b =-.03(.04), p =ns], tension [b =-.03(.04), p =ns], and happiness [b =-.07(.05), p =ns] recovery scores.

Finally, a series of ordinary least squares regressions were performed to test whether attributions of race-based discrimination predict anger, depression, tension, and happiness on day 2. The findings reveal that causal attributions of race-based do not predict anger [b =.02(.04), p =ns], depression [b =.03(.04), p =ns], tension [b =-.01(.03), p =ns], or happiness [b =-.05(.06), p =ns].

Change Scores

Next, an ordinary least squares regression was performed to determine whether causal attributions of race-based discrimination predict the change in participants' anger scores from baseline to the post-manipulation 2 time point. Specifically, a term was created in which I subtracted participants' anger scores at baseline from their scores at the post-manipulation 2 time point. The findings reveal that participants who made greater causal attributions of race-based discrimination experienced larger increases in their anger from baseline to 10-13 minutes following the manipulation, b =.17(.06), p =.01. The model explained 18% of the variance, $F(1,34)=7.35$, p=.01.

An ordinary least squares regression was then performed to determine whether causal attributions of race-based discrimination predict the change in participants' depressive affect scores from baseline to the post-manipulation 2 time point. The findings reveal that participants who made greater causal attributions of race-based attribution experienced marginally larger increases in their depressive affect from baseline to 10-13 minutes following the manipulation, *b* =.08(.046), *p* =.08. The model explained 38% of the variance, $F(2,34)=10.41$, $p<.001$.

Next, two other ordinary least squares regressions were performed to investigate whether attributions of race-based discrimination predict change scores (post-manipulation 2-baseline) for tension, and happiness. The findings reveal that causal attributions of race-based discrimination did not predict tension [*b* =.03(.03), *p* =ns] or happiness [*b* =.09(.06), *p* =ns] change scores.

Finally, ordinary least squares regressions were performed to investigate whether attributions of race-based discrimination predict day 2 change scores (day 2-baseline) for anger, tension, and happiness. The results reveal that attributions of race-based discrimination do not predict change scores for anger [*b* =.02(.04), *p* =ns], depression [*b* =.03(.04), *p* =ns], tension [*b* =-.01(.03), *p* =ns], and happiness [*b* =-.05(.06), *p* =ns].

Do causal attributions of race-based discrimination predict heart rate and blood pressure reactivity?

Heart Rate

Raw Scores

To determine whether causal attributions of race-based discrimination predict heart rate reactivity[15], I performed an ordinary least squares regression that tested whether attributions predicted heart rate during the manipulation, controlling for baseline. The findings suggest that causal attributions were not predictive [*b* =-.09(4.36), *p* =ns] of heart rate reactivity. Thereafter, I examined whether causal attributions of race-based discrimination predict heart rate at the 5-minute spontaneous rumination period, controlling for baseline. The findings suggest that causal attributions also did not predict heart rate at this time point [*b* =.33(.36), *p* =ns].

Change Scores

To determine whether causal attributions of race-based discrimination predict heart rate reactivity, I also performed an ordinary least squares regression that tested whether attributions predict the change in participants' heart rate activity from baseline to the manipulation. The findings reveal that causal attributions did not predict participants' heart rate change scores [*b* =-.14(.45), *p* =ns]. Finally, I performed an ordinary least squares regression to determine whether attributions predict the change in participants' heart activity from baseline to the 5-minute spontaneous rumination period. The findings reveal that causal attributions of race-based do not predict the change in participants' heart rate changes scores [*b* =.28(.38), *p* =ns].

Blood Pressure

Raw Scores

[15] To assess physiological reactivity, I examined participants' outcomes during the manipulation and the 5-minute spontaneous rumination period as well as the change in participants' outcomes from baseline to the manipulation and 5-minute spontaneous rumination period. To assess recovery, I examined participants' outcomes at the subsequent post-manipulation time points as well as on day 2.

To determine whether causal attributions of race-based discrimination predict blood pressure reactivity, I performed ordinary least squares regressions that tested whether attributions predicted systolic blood pressure during the manipulation and the 5-minute spontaneous rumination period, controlling for baseline. The findings suggest that causal attributions were not predictive of systolic blood pressure during the manipulation [*b* =.80(.88), *p* =ns] or during the 5-minute spontaneous rumination period [*b* =1.32(1.08), *p* =ns].

I also performed ordinary least squares regressions to determine whether attributions predicted diastolic blood pressure during the manipulation and the 5-minute spontaneous rumination period, controlling for baseline. The findings suggest that causal attributions were not predictive of diastolic blood pressure during the manipulation [*b* =-.27(.67), *p* =ns] or during the 5-minute spontaneous rumination period [*b* =.93(.74), *p* =ns].

Finally, I performed ordinary least squares regressions to determine whether attributions predicted MAP during the manipulation and the 5-minute spontaneous rumination period, controlling for baseline. The findings suggest that causal attributions were not predictive of MAP during the manipulation [*b* =.93(.60), *p* =ns] or during the 5-minute spontaneous rumination period [*b* =.16(.88), *p* =ns].

Change Scores

To determine whether causal attributions of race-based discrimination predict blood pressure reactivity, I also performed ordinary least squares regressions to determine whether attributions predicted the change in participants' systolic blood pressure from baseline to the manipulation and the 5-minute spontaneous rumination period. The findings suggest that causal attributions were not predictive of systolic blood pressure change scores for the manipulation [*b* =.84(.88), *p* =ns] or the 5-minute spontaneous rumination period [*b* =1.33(1.06), *p* =ns].

I also performed ordinary least squares regressions to determine whether causal attributions of race-based discrimination predicted the change in participants' diastolic blood pressure from baseline to the manipulation and the 5-minute spontaneous rumination period. The findings suggest that causal attributions were not predictive of diastolic blood pressure change scores for the manipulation [*b* =-.64(.72), *p* =ns] or the 5-minute spontaneous rumination period [*b* =.43(.88), *p* =ns].

Finally, I performed ordinary least squares regressions to determine whether causal attributions of race-based discrimination predicted the change in participants' MAP from baseline to the manipulation and the 5-minute spontaneous rumination. The findings suggest that causal attributions were not predictive of MAP change scores for the manipulation [*b* =.15(.51), *p* =ns] or the 5-minute spontaneous rumination period [*b* =.76(.63), *p* =ns].

Do causal attributions of race-based discrimination predict heart rate and blood pressure recovery?

Heart Rate

Raw Scores

To determine whether causal attributions of race-based discrimination predict heart rate recovery, I performed a series of ordinary least squares regression models that tested whether attributions predicted heart rate at the post-manipulation 1 and 2 time points , approximately 7-11and 12-16 minutes after the manipulation, as well as heart rate on day 2, controlling for baseline. The findings suggest that causal attributions of race-based discrimination did not predict participants' heart rate at the post-manipulation 1 time point [*b* =-.40(1.29), *p* =ns], post-manipulation 2 time point [*b* =-.01(1.57), *p* =ns], or on day 2 [*b* =1.66(2.29), *p* =ns].

Change Scores

Additionally, I performed a series of ordinary least squares regression models to determine whether causal attributions of race-based discrimination predict the change in participants' heart rate from baseline to the post-manipulation 1 and 2 time points as well as from baseline to day 2. The findings reveal that causal attributions of race-based discrimination marginally predicted the change in participants' heart rate activity from baseline to day 2, [*b* =.69(.37), *p* =08]. Specifically, the participants who made greater attributions of race-based discrimination had a marginally higher increase in their heart rate activity than the participants who were less likely to make race-based attributions or who did not make the attributions at all. Conversely, causal attributions of race-based discrimination did not predict the change in participants' heart rate scores, relative to baseline, at the post-manipulation 2 time point [*b* =.57(.43), *p* =ns] or on day 2 [*b* =.28(.93), *p* =ns].

Blood Pressure

Raw Scores

To determine whether causal attributions of race-based discrimination predict blood pressure recovery, I performed a series of ordinary least squares regressions that investigated whether attributions predicted systolic blood pressure activity at the post-manipulation 1time point, the post-manipulation 2 time point, approximately 7-11and 12-16 minutes after the manipulation, and on day 2. The findings suggest that causal attributions were not predictive of systolic blood pressure at the post-manipulation 1 time point [*b* =.84(1.49), *p* =ns], at the post-manipulation 2 time point [*b* =1.32(.83), *p* =ns], and on day 2 [*b* =-1.86(1.54), *p* =ns].

I also performed ordinary least squares regressions to determine whether attributions predicted diastolic blood pressure at the post-manipulation 1 and post-manipulation 2 time points as well as on day 2. The findings suggest that causal attributions were not predictive of diastolic

blood pressure systolic blood pressure at the post-manipulation 1 time point [*b* =.04(.88), *p* =ns], at the post-manipulation 2 time point [*b* =.41(.92), *p* =ns], and on day 2 [*b* =-1.57(.93), *p* =ns].

Finally, I performed ordinary least squares regressions to determine whether attributions predicted MAP at the post-manipulation 1 and post-manipulation 2 time points as well as on day 2. The findings suggest that causal attributions were not predictive of MAP at the post-manipulation 1 time point [*b* =.16(.88), *p* =ns], at the post-manipulation 2 time point [*b* =.29(1.05), *p* =ns], and on day 2 [*b* =-1.70(.93), *p* =ns].

Change Scores

Additionally, I performed a series of ordinary least squares regression models to determine whether causal attributions of race-based discrimination predict the change in participants' systolic blood pressure from baseline to the post-manipulation 1 and 2 time points as well as from baseline to day 2. The findings suggest that causal attributions were not predictive of systolic blood pressure change scores for the post-manipulation 1 time point [*b* =.84(1.46), *p* =ns], the post-manipulation 2 time point [*b* =.29(1.77), *p* =ns], or on day 2 [*b* =-2.29(2.29), *p* =ns].

I also performed ordinary least squares regressions to determine whether causal attributions of race-based discrimination predicted the change in participants' diastolic blood pressure from baseline to the post-manipulation 1 and 2 time points as well as from baseline to day 2. The findings suggest that causal attributions were not predictive of diastolic blood pressure change scores for the post-manipulation 1 [*b* =-.26(.89), *p* =ns] and 2 [*b* =.09(.93), *p* =ns] time points. However, causal attributions of race-based discrimination were marginally predictive of the diastolic blood pressure change scores for day 2 [*b* =-2.65(1.33), *p* =.06].

Finally, I performed ordinary least squares regressions to determine whether causal attributions of race-based discrimination predicted the change in participants' MAP from baseline to the post-manipulation 1 time point, the post-manipulation 2 time point, and day 2. The findings suggest that causal attributions were not predictive of MAP change scores for the post-manipulation 1 time point [b =.11(.86), p =ns], the post-manipulation 2 time point [b =.16(1.04), p =ns], or day 2 [b =-2.54(1.54), p =ns].

Do causal attributions of race-based discrimination predict stressful and bothersome appraisals as well as appraisals in which one has something to lose?

A series of ordinary least squares regressions were performed to investigate whether causal attributions of race-based discrimination predict cognitive appraisals. The first regression model tested whether attributions of race-based discrimination predict how bothered the participants were by the manipulation. The findings reveal that the more the participants attributed the event to racial discrimination, the more bothered they were by the interaction, b =.34(.09), p <.001. The model explained 30% of the variance in bothersome appraisals, $F(1,35)$= 16.86, p <.001.

The second model tested whether causal attributions of race-based discrimination predict how stressful the participants rated the interaction. The findings reveal that the more the participants attributed the event to racial discrimination, the more (marginally) they appraised the situation as being stressful, b =.16(.08), p =.06. The model explained 10% of the variance in stressful appraisals, $F(1,35)$= 3.69, p =.06.

Finally, the third model tested whether causal attributions of race-based discrimination predict participants' assessments of what they had to lose. The findings reveal that this relationship was nonsignificant, b =.01(.06), p =.ns.

Do causal attributions of race-based discrimination predict rumination?

A series of ordinary least squares regressions were performed to investigate whether causal attributions of race-based discrimination predict rumination. The first regression model tested whether causal attributions of race-based discrimination predict the extent to which participants had intrusive thoughts about the laboratory event. The findings reveal that this relationship was nonsignificant, b =.08(.06), p =ns. The second regression model tested whether causal attributions of race-based discrimination predict the extent to which the participants tried to avoid thinking about the laboratory event. This relationship was also nonsignificant, b =.07(.06), p =ns. The third regression model tested whether causal attributions of race-based discrimination predict how much the participants directly reported thinking about the laboratory event. The findings reveal that this relationship is marginally significant such that participants who made greater causal attributions of race-based discrimination reported thinking about the event more, b =.14(.08), p =.08. The model explained 8% of the variance in participant responses for how much they thought about the laboratory event, $F(1,35)$= 3.19, p =.08. Finally, the fourth and fifth regression models tested whether causal attributions predicted the extent to participants wrote about/discussed the interaction in their post-manipulation and day 2 stream of thought diaries. The findings reveal that causal attributions of race-based discrimination did not predict rumination in the post-manipulation [b =.04(.05), p =ns] and day 2 [b =.02(.02), p =ns] stream of thought diaries.

Research Question 3

Do causal attributions of race-based discrimination and racial identity interact to predict the various outcomes?

Do causal attributions of race-based discrimination and racial identity interact to predict emotional reactivity?

A series of ordinary least squares regressions were performed to investigate whether causal attributions of race-based discrimination and racial identity interact to predict emotional reactivity. With regard to racial identity, the results reveal there were no significant main effects for centrality or public regard in predicting emotional reactivity. With regard to moderation, the findings suggest that the interaction between causal attributions of race-based discrimination and centrality as well as the interaction between causal attributions of race-based discrimination and public regard were not associated with participants' depressive affect, anger, and happiness at the post-manipulation 1 time point (p= ns). The interaction between causal attributions of race-based discrimination and centrality did, however, predict participants' post-manipulation 1 tension scores, b =-.09(.04), p =.05. The overall model explained 16% of the variance in participants' tension scores at this time point, $F(3,33)=2.05$, p=*ns*. The results indicate that individuals who report that race is central to their self-concept (high centrality; 1 standard deviation above the mean) and who were less likely to attribute the laboratory event to race (low attribution; 1 standard deviation below the mean) reported experiencing the most tension at the post-manipulation 1 time point (see Figure10). Furthermore, simple slope tests indicated that the slope of the association between causal attributions of race-based discrimination and tension was marginally different from zero (t=1.71, p=.096) for those with relatively lower levels of racial centrality (1 standard deviation below the mean). Conversely, the association between causal attributions of race-based discrimination and tension was not significantly different from zero (t=-.124; p=ns) for those who with relatively higher levels of racial centrality.

The findings also indicate no significant interactions between causal attributions of race-based discrimination and racial centrality or public regard for depressive affect, anger, and tension change scores (Post-Manipulation 1-baseline) (p=ns).

Do causal attributions of race-based discrimination and racial identity interact to predict emotional recovery?

A series of ordinary least squares regressions were performed to investigate whether causal attributions of race-based discrimination and racial identity interact to predict emotional recovery. With regard to racial identity, the results reveal there were no significant main effects. The findings indicate no significant interactions between causal attributions of race-based discrimination and racial centrality or public regard for participants' depressive affect, anger, tension, and happiness at the post-manipulation 2 time point. However, the findings reveal that the interaction between causal attributions of race-base discrimination and centrality marginally predict participants' happiness scores on day 2, b =-.15(.08), p =.08. Specifically, participants who are high on racial centrality and who were less likely to make causal attributions of race-based discrimination reported feeling the happiest on day 2 (see Figure 11). The overall model explained 17% of the variance in participants' day 2 happiness scores, $F(3,33)=2.29$, p=.10. Simple slope tests indicated a significant association between causal attributions of race-based discrimination and day 2 happiness scores for individuals higher in racial centrality (t=.-2.19, p=.04), but no significant association for individuals with lower levels of racial (t=0.54, p=ns).

No significant interactions were found between causal attributions of race-based discrimination and racial centrality or public regard in predicting participants' depressive affect, anger, and tension change scores for the post-manipulation 2 time point (Post-Manipulation 1-baseline) or on day 2 (Day 2-baseline) (p=ns).

Do causal attributions of race-based discrimination and racial identity interact to predict heart rate reactivity?

A series of ordinary least squares regressions was performed to investigate whether causal attributions of race-based discrimination and racial identity interact to predict heart rate reactivity. No significant main effects were found for the racial identity variables. Also, there were no significant interactions between causal attributions of race-based discrimination and racial centrality or public regard in predicting participants' heart rate at the post-manipulation 1 time point (p=ns) or in predicting participants' heart rate change scores (Post-manipulation 1-baseline) (p=ns).

Do causal attributions of race-based discrimination and racial identity interact to predict heart rate recovery?

A series of ordinary least squares regressions were performed to investigate whether causal attributions of race-based discrimination and racial identity interact to predict heart rate recovery. The results indicated no significant main effects were found for the racial identity variables or significant interactions between causal attributions of race-based discrimination and the racial identity variables in participants' heart rate at the post-manipulation 2 time point (p=ns), on day 2 (p=ns), or on the change in heart rate from baseline to day 2 (p=ns).

Do causal attributions of race-based discrimination and racial identity interact to predict cognitive appraisals?

A series of ordinary least squares regressions were performed to investigate whether causal attributions of race-based discrimination and racial identity interact to predict cognitive appraisals. The results indicated no significant main effects were found for the racial identity variables or significant interactions between causal attributions of race-based discrimination and

the racial identity variables in participants' bothersome and stressful appraisals or their appraisals of what they had to lose (*p*=ns).

Do causal attributions of race-based discrimination and racial identity interact to predict rumination?

A series of ordinary least squares regressions were performed to investigate whether causal attributions of race-based discrimination and racial identity interact to predict rumination. The results indicated no significant main effects were found for the racial identity variables or significant interactions between causal attributions of race-based discrimination and the racial identity variables in intrusive thoughts, avoidance, participants' direct reports of how much they thought about the event, or the extent to which the participants wrote about/discussed the event in their stream of thought diaries (*p*=ns).

Research Questions 4

Are the relationships between causal attributions of race-based discrimination and the emotional, heart rate, and blood pressure outcomes mediated by cognitive appraisals (reactivity outcomes) and rumination (recovery outcomes) and are these proposed mechanisms moderated by racial identity?

Emotional Reactivity

With regard to emotional reactivity, there are four significant moderated mediation models: 2 for tension and 2 for anger[16]. The findings from the first model (see Table 10) reveal

[16] Recently, researchers and statisticians have suggested bootstrapping as a way of testing indirect effects while simultaneously avoiding power issues. Following the recommendations of Hayes (under review), I conducted moderated mediation analyses using the PROCESS macro (Hayes, 2013). This macro uses an ordinary least squares or logistic regression-based path analytic framework for estimating direct and indirect effects in simple and multiple mediator models and a number of other conditional process analyses. Additionally, PROCESS generates a bootstrap confidence interval that is used to determine whether an indirect effect is significant (Hayes, 2013). Once the

there was a positive indirect effect of causal attributions of race-based discrimination on tension at the post-manipulation 1 time point (M+7 to 9 minutes) through the bothersome appraisal. However, this indirect effect was only significant for individuals who are at low or moderate (at the mean) levels of racial centrality. In other words, for individuals who are moderately race central or not race central at all, experiencing the event as being more race-related increases their appraisals of the event as being bothersome, which in turn, increases the amount of tension they feel.

The findings from the second model (see Table 11) reveal there was a positive indirect effect of causal attributions of race-based discrimination on tension at the post-manipulation 1 time point (M+7 to 9 minutes) through bothersome appraisals. Although the indirect effect was significant for individuals at relatively low, moderate, and high levels of public regard, the indirect effect was larger for individuals who are relatively high on public regard. This finding suggests that the indirect effect was linearly related to public regard.

The findings from the third model (see Table 12) reveal there was a positive indirect effect of causal attributions of race-based discrimination on anger at the post-manipulation 1 time point (M+7 to 9 minutes) through bothersome appraisals for individuals who are at low or moderate levels of racial centrality.

Finally, the findings from the fourth model (see Table 13) reveal that there was a positive indirect effect of causal attributions of race-based discrimination on anger at the post-

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confidence interval is generated, the user is to determine whether this confidence interval straddles zero. If the confidence interval does not straddle zero, the user is provided with evidence that the indirect effect is significant (Hayes, under review). Moreover, the user is provided with information about the levels of the moderator at which the indirect effect is significant (moderated mediation). It is important to note that Hayes (in press) makes the case that a nonsignificant interaction between a predictor and the moderator "does not mean that the indirect effect is not linearly related to *W* (the moderator), as is generally believed" (Hayes, under review, p. 14), with the rationale being that *W* moderates the product and paths a and b.

manipulation 1 time point (M+7 to 9 minutes) through bothersome appraisals. Although the indirect effect was significant for individuals with relatively low, moderate, and high levels of public regard, the indirect effect was largest for individuals who are high on public regard.

Physiological Reactivity

With regard to physiological reactivity, there is one significant moderated mediation model. Specifically, the findings (see Table 14) reveal there was a positive indirect effect of causal attributions of race-based discrimination on heart rate activity during the manipulation through the bothersome appraisal for individuals with relatively moderate levels of centrality.

Emotional Recovery

With regard to emotional recovery, I first tested the moderated mediation with the first mediator, cognitive appraisals. The findings suggest that there was no significant moderated mediation for any of the various emotions at the post-manipulation 2 time point (M+10 to 13 minutes). However, there are two significant moderated mediation models for participants' tension scores on day 2. The findings from the first model (see Table 15) reveal that there was a positive indirect effect of causal attributions of race-based discrimination on tension on day 2 through bothersome appraisals for individuals who are at low and moderate levels of racial centrality.

The findings from the second model (see Table 16) reveal that there was a positive indirect effect of causal attributions of race-based discrimination on tension on day 2 through bothersome appraisals. Although the indirect effect was significant for individuals with relatively low, moderate, and high levels of public regard, the indirect effect was largest for individuals who are high on public regard.

As I argued that rumination was a mechanism by which the African American participants would experience extended emotional stress responses, I then examined whether there was a significant indirect effect of causal attributions on tension on day 2 through both cognitive appraisals and rumination. Specifically, I performed a 2-mediator meditational analyses in PROCESS[17]. The findings reveal that the indirect effect of causal attributions on tension through cognitive appraisals and rumination was nonsignificant.

Physiological Recovery

With regard to physiological recovery, there is one significant moderated mediation model. Specifically, the findings (see Table 17) reveal there was a positive indirect effect of causal attributions of race-based discrimination on diastolic blood pressure activity at the post-manipulation 2 time point (M+12 to 16 minutes) through bothersome appraisals for individuals with relatively moderate levels of centrality.

As I argued that rumination was a mechanism by which the African American participants would experience extended physiological stress responses, I then examined whether there was a significant indirect effect of causal attributions on diastolic blood pressure through both cognitive appraisals and rumination. Specifically, I performed a 2-mediator meditational analysis in PROCESS. The findings reveal that the indirect effect of causal attributions on tension through cognitive appraisals and rumination was nonsignificant.

[17] According to Hayes, "PROCESS has no models that combine moderation and serial mediation". As such, the original moderated model, with both cognitive appraisals and rumination as mediators, was not performed.

CHAPTER V: DISCUSSION

The purpose of the dissertation was to examine: 1) whether an ambiguous event will have more negative consequences if it is experienced as being race-related than if it is not experienced as being race-related; 2) the ways in which responses to a race-related stressor unfold over time in comparison to a non-race-related stressor; and 3) the processes by which a race-related stressor contributes to negative psychological, physiological, and physical health outcomes. More specifically, the dissertation study examined how African American women experienced and responded to a laboratory event over a 2-day period. The study findings suggest that the majority of the participants experienced the event as being race-related, regardless of condition. As such, the between-condition analyses mainly focused on the differences between experiencing racial discrimination in which the perpetrator is White and racial discrimination in which the perpetrator is African American. The findings for these analyses suggest that the participants generally had negative psychological and physiological responses to the event, although the ways in which the participants' responses to the events unfolded over time differed based on whether they interacted with the White or African American perpetrator and the extent to which they experienced the event as being race-related. Finally, the dissertation study was concerned with the importance of racial identity, causal attributions of race-based discrimination, cognitive appraisals, and rumination. Specifically, causal attributions of race-based discrimination and cognitive appraisals were conceptualized as interpretative processes whereas rumination was conceptualized as a mechanism by which the African American female college students may experience longer recovery periods.

In the present chapter, I interpret the preliminary and key findings in the context of past research on racial discrimination as well as in the context of my body of work. To begin, I review the impact of race-based situational cues – whether the confederate was White or African American – on causal attributions, emotional and physiological outcomes, cognitive appraisals, and rumination. With respect to the primary research questions, I first examine whether the interplay between race-based situational cues and racial identity predicts causal attributions of race-based discrimination. Next, I examine whether causal attributions of race-based discrimination predict emotional reactivity and recovery, physiological reactivity and recovery, cognitive appraisals, and rumination. Thereafter, I examine whether the interplay between causal attributions of race-based discrimination and racial identity predicts the aforementioned constructs. I then present the results with regard to moderated mediation analyses to examine whether cognitive appraisals and rumination mediate the relationship between causal attributions of race-based discrimination and emotional and physiological reactivity and recovery, and whether these mechanisms depend on the African American female college students' racial identity attitudes. Finally, I conclude the chapter with a discussion of the limitations of the present study, directions for future research, implications of the study findings, and concluding thoughts.

Situational factors Predicting Causal Attributions of Race-based Discrimination

Although many believe we live in a post-racial society, there is an abundance of evidence to suggest that racial discrimination is still a common experience for many African American adults and college students (Swim et al., 2003; Sue et al., 2007; Sue et al., 2008). In the present study, several participants reported that they frequently experience racial discrimination in their real lives. For instance, one participant stated that she is happy someone is doing research on

racial discrimination because it is something she "deals with all the time". Another participant stated that she experiences racial discrimination on the university campus "on a regular basis" while a third participant stated that there have been a few occasions in real life in which she felt similarly discriminated against with regard to her intellect. Finally, a fourth participant stated that she experiences racial discrimination on the university campus so often that she has become "desensitized" to it. These narratives are a huge cause for concern given the relatively young age of the sample. Moreover, these kinds of real-life experiences are likely to negatively impact many African American/Black American students' academic success and retention.

As several of the participants reported frequently experiencing racial discrimination in their real lives and on their college campus, it is not surprising that many participants experienced the laboratory event as being race-related. It was surprising, however, that approximately 80% of the participants attributed the laboratory event's occurrence to racial discrimination. This finding suggests that the laboratory paradigm may have provided participants with more race-relevant cues indicating the possibility of racial discrimination than originally anticipated. Although the confederate did not explicitly state that she was rejecting the participant because of race, it was clear that the confederate was operating under the assumption that the participant was intellectually or scholastically inferior. Given the widespread stereotypes that exist about African Americans with regard to their intellect and ability (e.g., stupid, lazy, etc.), it may be reasonable to assume that these stereotypes about African Americans' inferiority were activated or became salient for many of the African American participants during and/or following the interaction with the confederate. If this was the case, the laboratory paradigm provided participants with more than one kind of race-based situational cue: the race of the perpetrator, as intended, as well as the stereotypes about African Americans' intellect and ability.

Indeed, the large literature on stereotype threat has proposed and found support for the notion that race-based situational cues in the environment can activate domain-relevant or domain-specific stereotypes about one's racial group (e.g., Steele, 1997). Furthermore, the participants, experimenters, and confederates – all female – were matched on gender thereby making gender-based causal attributions less likely and race-based causal attributions the most likely (i.e., gender, social class, physical appearance, etc.). Moreover, participants who were treated as if they are intellectually inferior by the African American confederate were just as likely to offer race as an explanation for their not being chosen as those who were treated as if they are intellectually inferior by the White confederate. This interesting finding suggests that in contexts wherein widespread, negative stereotypes about the racial inferiority of African Americans are made salient, African American individuals may be equally likely to expect that White Americans and other African Americans will hold these stereotypes and behave in ways consistent with these stereotypes.

Interplay between Race-based Situational cues and Racial Identity Predicting Causal Attributions of Race-based Discrimination

The first research question focused on whether the interplay between race-based situational cues and racial identity predicted the African American female college students' causal attributions of race-based discrimination. Based on the findings of previous studies (Sellers et al., 2003; Sellers et al., 2006; Sellers & Shelton, 2003; Shelton & Sellers, 2000), I hypothesized that the participants who were assigned to the condition in which they were treated as if they are intellectually inferior by a White Confederate and who are relatively high on racial centrality or who are relatively low on public regard would be the most likely to make causal attributions of race-based discrimination. Contrary to my hypotheses, the results of the present

study indicated that these interactions were nonsignificant. Race-based situational cues and racial identity – centrality and public regard – did not interact to predict causal attributions of race-based discrimination.

The finding that the interaction between race-based situational cues and racial identity was not associated with causal attributions of race-based discrimination is inconsistent with the findings of Hoggard & Sellers (in prep). In their study, Hoggard and Sellers (in prep) found that participants in the blatant and ambiguous racial cue conditions who believed that outgroup members view African Americans negatively were comparatively more likely to make causal attributions of race-based discrimination for an event – being denied an opportunity to win an iPod – than the participants in these conditions who believed that outgroup members view African Americans positively. The discrepancy between the findings of the present study and that of Hoggard & Sellers (in prep) may be notable as it indicates that race-based situational cues (e.g., the race of the perpetrator) and their role in the experience of racial discrimination may be best understood within the historical context of race in the United States. Specifically, being denied an opportunity to win a reward may not have activated particular stereotypes about the racial inferiority of African Americans whereas being insulted on the basis of one's intellect likely activated stereotypes about the intellectual inferiority of African Americans. Indeed, African Americans have a long history of being plagued by institutional racism in the educational context and individual acts of racism on the basis of intellect in the United States. Moreover, gaps in school achievement and retention rates between White Americans and African American have been persistent in the United States (e.g., Steele, 1992). Finally, stereotype threat theorists and researchers assert that the activation of domain-relevant or domain-specific stereotypes about one's racial group – even in the absence of a specific act of racial

discrimination – is sufficient to impair an individual's performance on a school exam, standardized test, or other tasks in the laboratory context, regardless of whether the individual endorses the stereotype (e.g., Steele, 1997).

In order to examine the interplay between race-based situational cues and racial identity and to identify potential sources of variability in how African Americans experience race-related events, future researchers should take care to ensure that the intended race-related and non-race-related stressors are substantially different with regard to race-based situational cues. Specifically, the race-related event should have many more race-based cues indicating the possibility of racial discrimination than the non-race-related event. In doing so, researchers should take into consideration the historical context of race in the United States (e.g., pervasiveness of stereotypes) as this contextualized examination and nuanced understanding may help researchers better understand how various racial discrimination events may be experienced by many African Americans.

Responses to Racial Discrimination for Overall Sample

Not surprisingly, the participants generally responded to the interaction with the confederate negatively. One participant noted in one of her diaries that she was "very upset" by the interaction with the confederate and that she had spoken with her mother directly after her experimental session on the first day to seek advice on how to handle the situation. Another participant noted that she was "SAD," "MAD," "UPSET," and "DISAPPOINTED." Finally, a third participant noted that she felt "incredibly angry because of what happened during the interruption". This participant then went on to write the following: "Being told I was too stupid to be a part of a study… I am very upset & I can't stop thinking about this". Based on their narratives, it is clear that these individuals felt personally attacked or insulted.

Consistent with these narrative accounts, the quantitative data suggest that the participants experienced the event somewhat negatively. Participants reported being relatively angry and depressed at the post-manipulation 1 time point, approximately 7-9 minutes after the manipulation. It is important to note that participants' anger and depressive affect, overall, was highest at this time point of the experiment. Surprisingly, the participants' heart rate activity during the manipulation – approximately 74 beats per minute – was not at its peak and was not consistent with a fight or flight response. Instead, it was consistent with a state of physiological rest for these young African American/Black females[18]. Conversely, participants' blood pressure activity during the manipulation – approximately 136/90 mmhg or a mean 105 – was consistent with a fight or flight response[19]. Interestingly, the African American participants had the highest blood pressure at the post-manipulation 1 time point– 142/94 mmhg or a mean of 110 – and the post-manipulation 2 time point – 139/93 mmhg or a mean of 108. These responses may be indicative of an extended fight or flight response as the post-manipulation 2 time point began approximately 12-16 minutes after the manipulation on day 1. In fact, these findings may suggest that African American participants' blood pressure responses intensified over time. The notion that the African American participants' blood pressure responses to the event – an event that was only approximately 2 minutes in duration – persisted for at least 12-16 minutes after the event provides support for the allostatic load theoretical framework. Specifically, the findings suggest

[18] Using data from the National Health and Nutrition Examination Survey (NHANES), Ostchega and colleagues found support for age, race/ethnicity, and gender-based differences in resting pulse rate such that Black females aged 16-19 had a mean resting pulse rate of 77 beats per minute and females aged 20-39 years of age had a mean resting pulse rate of 76 beats per minute (Ostchega et al., 2011).

[19] According to Stern et al., (2001), 120/80 mmhg is normal resting blood pressure among college students whereas 140/90 mmhg is symptomatic of hypertension, a disease that is very prevalent among African Americans/Black Americans.

that the African American participants' blood pressure responses, on average, may not have been "shut off" immediately following the cessation of the stressor. Moreover, the findings suggest that instead of being "shut off," the blood pressure responses were generally increasing as more time elapsed thereby, providing additional support for the allostatic load and highlighting the importance of examining recovery responses in addition to reactivity responses.

With regard to the cognitive appraisals, the African American participants, on average, reported that they experienced the laboratory event as being moderately bothersome and "a little" stressful, and that they had little or nothing to lose in the situation. With regard to rumination, the African American participants, on average, reported not having or rarely having intrusive thoughts about the event since its occurrence on the previous day, not trying to avoid thinking about the event, and not thinking about the event much. Despite these findings, the debriefing interview with the participants revealed that several of the participants thought about the event frequently or intensely after leaving the laboratory on day 1. For instance, one participant reported that she had spoken with her mother immediately after the first experimental session to solicit her advice about how to handle the situation. Similarly, another participant reported that she discussed the interaction with her mother during their lunch following her first experimental session. Moreover, three participants indicated that they thought about the interaction later that night. Finally, one participant indicated that she had thought about the interaction later that night as well as on the following morning (morning of the second experimental session). Taken together, the findings suggest that the event was threatening or harmful, not challenging, as theorized by Lazarus and Folkman (1984).

Causal Attributions of Race-based Discrimination and Responses to Racial Discrimination

With regard to the second research question, I hypothesized that causal attributions of race-based discrimination would predict participants' emotional reactivity and recovery, physiological reactivity and recovery, cognitive appraisals, and rumination. The findings suggest that there was support for these hypotheses. As aforementioned, 80% of the participants experienced the event as being race-related. With regard to the relationship between causal attributions and emotional outcomes, the findings reveal there is a positive relationship between causal attributions of racial discrimination and emotional reactivity and emotional recovery. Specifically, participants who made greater attributions of race-based discrimination reported being angrier at the post-manipulation 1 and 2 time points – 7-9 minutes and 10-13 minutes after the manipulation, respectively – and reported greater changes in their anger as compared to their baseline anger. Similarly, these participants reported larger increases in their depressive affect and tension from baseline to the post-manipulation 1 time point than the participants who were less likely to make causal attributions of race-based discrimination. Moreover, causal attributions of race-based discrimination marginally predicted the change in participants' heart rate from baseline on day 1 to day 2. Specifically, participants who made greater attributions of race-based discrimination experienced marginally larger increases in their heart rate from baseline on day 1 to day 2. Similarly, causal attributions of race-based discrimination predicted changes in diastolic blood pressure from day 1 to day 2. Surprisingly, participants who made greater attributions of race-based discrimination experienced marginally larger decreases in their diastolic blood pressure from baseline on day 1 to day 2. Causal attributions also predicted individuals' cognitive appraisals. Specifically, I found that there was a positive relationship between causal

attributions of race-based discrimination and cognitive appraisals such that the participants who made greater attributions of race-based discrimination reported that the event was more bothersome and stressful. Finally, the results reveal that the participants who made greater attributions of race-based discrimination directly/explicitly reported thinking about the interaction with the confederate more, suggesting that causal attributions of race-based discrimination also predict or relate to ruminative processes.

Taken together, the findings suggest that an event will trigger more anger, depressive affect, and anxiety as well as greater heart rate activity among African American individuals who make greater attributions of race-based discrimination, that is, those who experience the event as being more racially discriminatory. Moreover, the findings suggest that an event will be rated as more bothersome and stressful by African American individuals who experience the event as being more racially discriminatory. Interestingly, these findings challenge the notion that experiencing a negative event as racial discrimination involves attributing the event to an external cause (i.e., racial attitudes and prejudice of perpetrator) that protects one's self-esteem and presumably makes the event less personal (Crocker & Major, 1989; Major et al., 2002). Instead, the findings suggest that racial discrimination experiences may be quite personal and threatening for many African American individuals. Moreover, the findings suggest that these personal and threatening experiences may not merely be experienced in the moment. Instead, experiencing an event as racially discriminatory may trigger negative emotions and initiate physiological responses that persist over time.

Interplay between Causal Attributions of Race-based Discrimination and Racial Identity Predicting Responses to Racial Discrimination

With regard to the third research question, I hypothesized that individuals who made greater attributions of race-based discrimination and who are high on racial centrality or who are low on public regard would report being the most angry, the most depressed, the most tense, and the least happy. The findings reveal that there was a significant interaction between causal attributions of race-based discrimination and racial centrality predicting emotional responses although the findings were not as I expected. Specifically, the African American participants who did not make or were less likely to make attributions of race-based discrimination and reported that race is central to them experienced the most tension approximately 7-9 minutes after the manipulation. Although unexpected, the finding is interesting and somewhat intuitive. The fact that these individuals report that being African American is important to them but did not believe they were insulted because they are African American may suggest that these individuals had difficulty developing an explanation for the unfair treatment in the moment. According to several scholars, explaining away a negative event confers benefits whereas failing to do so is associated with poorer psychological well-being and health outcomes over time as these individuals have not resolved the issue and are therefore less able or prepared to cope (e.g., Bonanno et al., 2002, Davis et al., 1998). Conversely, individuals who report that being African American is important to them and who believed that they were insulted because they are African American experienced less tension at this time point, suggesting that these individuals were buffered. A potential explanation for this finding is that these individuals were able to develop an explanation for the event and were therefore able to move on or cope with it.

The findings also reveal that there was a significant interaction between causal attributions of race-based discrimination and racial centrality with regard to happiness on day 2. Specifically, the findings suggest that the highly race central individuals who did not experience the event as being race-related reported being the happiest on day 2. While this finding provides some support for my hypotheses, it seemingly contradicts the aforementioned interaction between causal attributions of race-based discrimination and racial centrality with regard to tension at the post-manipulation 1 time point on day 1. Specifically, individuals who are highly race central and experienced the event as being non-race-related or less racially discriminatory experienced the most tension shortly after the event occurred but also reported feeling the happiest on day 2. A potential explanation is that these individuals did indeed develop an alternate (non-race-related) causal attribution for the insult after the post-manipulation 1 time point on day 1. As such, these individuals subsequently felt less tension and were more at ease with regard to the interaction with the confederate. Another potential explanation is that these individuals no longer felt tension with regard to the event on day 2 because their African American identity – a social identity that is important to their self-concept – was not threatened by the interaction. As such, these individuals no longer felt tense and reported being relatively happy. Finally, a third explanation is that these individuals were able to effectively cope with the event after leaving the laboratory on day 1. Although I did not measure coping and the data cannot address this speculation, it is a reasonable and interesting possibility.

Race-based Situational Cues Predicting Responses to Racial Discrimination

Although the evidence with regard to the causal attributions of race-based discrimination was compelling, race-based situational cues provided important and interesting information regarding participants' responses to the event. Specifically, there were condition differences in

participants' emotional, heart rate, and blood pressure responses that were observed at various time points during the experiment. There was a marginally significant difference that emerged during the manipulation with regard to diastolic blood pressure such that the participants in the White confederate condition had a diastolic blood pressure of 91.37, whereas participants in the African American confederate condition had a diastolic blood pressure of 87.52. Moreover, there was a significant diastolic blood pressure difference during the 5-minute spontaneous rumination period. Participants in the White confederate condition had a diastolic blood pressure of 91.53 whereas participants in the African American confederate condition had a diastolic blood pressure of 86.67. Although these differences may seem negligible, they may have important implications. Elevated resting diastolic blood pressure – 90 mmhg or more – is a symptom of hypertension. Moreover, large amounts of pressure on the walls of the blood vessels can lead to the deterioration of these vessels. The observed condition differences in diastolic blood pressure suggest that those who were treated as if they are intellectually inferior by the White confederate exhibited higher blood pressure while the heart was at rest than those who were treated as if they are intellectually inferior by the African American confederate. This notion is of particular importance as it suggests that a mechanism by which outgroup racial discrimination may lead or contribute to illness (i.e., hypertension, clogging of the arteries, etc.) is by triggering a set of sympathetic nervous system responses wherein excess pressure is exerted on the walls of the blood vessels not only when the heart is contracting but also when it is resting and being refilled with blood.

Although there were condition-based differences in blood pressure during and immediately following the manipulation, there were no systolic, diastolic, or MAP raw score or change score differences at any of time points following the 5-minute spontaneous rumination

period on day 1 or during the 10-minute period on day 2. Moreover, there were no differences with regard to heart rate or emotions on day 1. However, there was a significant difference in heart rate during the 10-minute period on day 2 of the experiment. Specifically, the participants in the White confederate condition exhibited heart rate activity – 77.80 beats per minute – that exceeded that of the participants in the African American confederate condition – approximately 70.72 beats per minute – by approximately seven beats per minute. This finding suggests that the African American participants in the White confederate condition either experienced a longer recovery period across the 2 days of the experiment or that the African American participants' cardiovascular responses returned to baseline on day 1 but increased again on day 2 upon their arrival at the laboratory, the context in which they experienced the unfair treatment.

Although the difference in heart rate activity may seem to have little health or clinical significance at the individual-level, it may be quite meaningful at the population-level such that individuals who experience outgroup racial discrimination and have extended recovery periods and who re-experience the event may be at greater risk for cardiovascular illness. Furthermore, approximately 78 beats per minute may be consistent with a fight or flight response as resting pulse rate is 76-77 beats per minute for Black females aged 16-39 (Ostchega et al., 2011). The findings also reveal that there was a significant difference in participants' heart rate change scores as a function of condition. Specifically, the participants in the White confederate condition exhibited heart rate activity that was, on average, approximately 2 beats per minute higher than their heart rate activity at baseline on day 1. Conversely, the participants in the African American confederate condition exhibited heart rate activity that was, on average, about 5 beats per minute lower than their heart rate activity at baseline. These findings provide further support that there is a lagged effect and that the participants in the White confederate condition

are experiencing longer heart rate recovery periods. Finally, these findings suggest that the participants who were insulted by the White confederate may have experienced more anticipatory stress upon their return to the laboratory and this anticipatory stress was manifested by their comparatively higher heart rate. Indeed, scholars have argued that anticipatory stress may lead to or be manifest as elevated physiological activity (i.e., nocturnal blood pressure non-dipping) (Williams & Mohammed, 2009).

With regard to emotional activity, a marginally significant difference emerged on day 2 – but not on day 1 – with regard to how angry the participants reported feeling. Specifically, participants in the White confederate condition reported being significantly more angry. Moreover, there was a marginally significant difference with regard to the change in participants' anger scores on day 2 as compared to their baseline anger scores on day 1. The participants who were treated as if they are intellectually inferior by the White confederate experienced no change, on average, in their anger from baseline on day 1 to day 2. Conversely, the participants who were treated as if they are intellectually inferior by the African American confederate experienced a small decrease in anger from baseline on day 1 to day 2. A likely explanation for this finding is that participants were apprehensive about being outfitted with all of the physiological equipment – ECG, blood pressure, cardiac output, respiration – at baseline. As the novelty of the equipment and experiment would have likely worn off by participants' arrival on day 2, it would be expected that participants would report feeling less negative on day 2 – in the absence of the laboratory stressor. However, the participants in the White condition did not report feeling less negative and this lack of change can likely be attributed to the manipulation. Conversely, the participants in the African American confederate condition reported feeling slightly less angry than they did at baseline on day 1.

Taken together, the results suggest there was a lagged effect such that the duration of participants' anger responses were longer in the White confederate condition. In other words, the participants who were treated as if they are inferior by the White confederate experienced a longer emotional recovery period. A potential explanation for this finding is the participants in the White confederate condition experienced more anticipatory stress than their counterparts. This notion is also of clinical significance as several scholars argue that worry and anticipatory stress lead or contribute to extended recovery periods, that worry and anticipatory stress are linked to anxiety and depressive disorders, and that extended recovery periods are mechanisms by which stress gets under the skin (e.g., Brosschot et al., 2006; McEwen, 1998).

Are the Cognitive Appraisal and Rumination Processes Key Mechanisms?

With regard to the fourth research question, I hypothesized that making greater causal attributions of race-based discrimination would predict cognitive appraisals that, in turn, would predict emotional reactivity. Moreover, I hypothesized that the indirect effect would only be significant among African Americans who are highly race central or low on public regard. The findings provide some support for these hypotheses. Specifically, there was a positive indirect effect of causal attributions of race-based discrimination on tension at the post-manipulation 1 time point (M+7 to 9 minutes) through the bothersome appraisal. However, this indirect effect was only significant for individuals who are at low or moderate (at the mean) levels of racial centrality or who are at relatively low, moderate, and high levels of public regard. It is important to note that the indirect effect was larger for individuals who are relatively high on public regard. A potential explanation for the unexpected findings with regard to racial identity is that the laboratory stressor provided more race-based cues than originally anticipated. As such, it may have been the case that individuals who are less race central and who made causal attributions of

race-based discrimination were more surprised by the racial event, appraised the event as being more bothersome, and consequently experienced more tension. Conversely, individuals who are relatively highly race central and who made causal attributions of race-based discrimination may have been less surprised by the racial event and therefore were less bothered by it, resulting in them reporting less tension than their less race central counterparts. This finding suggests that highly race central individuals who experienced the event as race-related were buffered, providing support for the long-standing literature demonstrating buffering effects for racial identity (e.g., Neblett, Shelton, & Sellers, 2004; Sellers et al., 2003; Sellers et al., 2006). Moreover, this finding is consistent with stress, appraisal, and coping theory in that it indicates that the psychological experience of the event (i.e., causal attributions and cognitive appraisals) determined how individuals responded to the event (Lazarus & Folkman, 1984).

Moreover, the findings with regard to this indirect effect are potentially corroborated by the results from the interaction described above. Specifically, individuals who are highly race central and who made causal attributions of race-based discrimination reported experiencing less tension than the highly race central individuals who did not make causal attributions of race-based discrimination and low centrality individuals who did make causal attributions of race-based discrimination. Conversely, Hoggard and Sellers (in prep) found that low public regard individuals in the blatant condition were buffered with regard to how upset and distressed they were whereas the high public regard individuals were not. After juxtaposing the findings of the present study against those of Hoggard & Sellers (in prep), it is reasonable to conclude that careful attention must be paid to the ways in which racial identity operates in the context of racial discrimination and in the context of many (blatant) and few (ambiguous) race-based situational cues. Moreover, this notion further demonstrates the complexity of the racial

discrimination processes and highlights the need for more comprehensive models that depict and contextualize these processes.

With regard to physiological reactivity, I hypothesized that making greater causal attributions of race-based discrimination would predict cognitive appraisals that, in turn, would predict physiological reactivity. Moreover, I hypothesized that the indirect effects would only be significant among African Americans who are highly race central or are low on public regard. The findings provide some support for these hypotheses. Specifically, the findings reveal there was a positive indirect effect of causal attributions of race-based discrimination on heart rate activity during the manipulation through the bothersome appraisal for individuals. However, the indirect effect was only significant for individuals with moderate levels of centrality and was unrelated to public regard.

With regard to emotional and physiological recovery, I hypothesized that making greater causal attributions of race-based discrimination would predict cognitive appraisals that would predict increased rumination that, in turn, would finally positively predict emotional and physiological recovery. However, I hypothesized that the indirect effects would only be significant among African Americans who are highly race central or low on public regard. The findings reveal there was a positive indirect effect of causal attributions of race-based discrimination on tension on day 2 through bothersome appraisals for individuals who are at low and moderate levels of racial centrality and relatively low, moderate, and high levels of public regard. It is important to note that the indirect effect was largest for individuals who are high on public regard. As aforementioned, a potential explanation for the unexpected findings with regard to racial identity is that the stressor is more blatant or presented more race-based situational cues than originally anticipated. With regard to physiological recovery, the findings

reveal there was a positive indirect effect of causal attributions of race-based discrimination on diastolic blood pressure activity at the post-manipulation 2 time point (M+12 to 16 minutes) through bothersome appraisals for individuals with relatively moderate levels of centrality. These findings are consistent with those for physiological reactivity. Moreover, the indirect effect of causal attributions on tension through cognitive appraisals and rumination was nonsignificant, suggesting that rumination is not a significant mediator. It is possible that rumination was not a significant mechanism in this study as I examined how the African American participants experienced and responded to racial discrimination over a short period time. Two days may not have been enough time to examine the prolonged stress responses that have been theorized in the allostatic load and perseverative cognition hypotheses. Therefore, future studies should examine the ways in which racial discrimination processes and responses unfold over longer periods of time.

Taken together, the findings suggest that the processes by which racial discrimination may lead to negative outcomes are very complex. Specifically, experiencing an event as being more racially discriminatory may lead individuals to appraise an event as being more bothersome. Appraising an event as more bothersome may then lead to increased feelings of anxiety or tension, increased heart rate, and increased diastolic blood pressure over time. However, these specific processes and mechanisms may only operate or become activated when African Americans with low or moderate levels of racial centrality experience relatively blatant racial stressors. Moreover, these specific processes and mechanisms may be stronger when individuals who perceive that outgroup members view African Americans positively experience relatively blatant racial stressors. These findings suggest there is a great necessity for researchers to further explicate the potential mechanisms by which racial discrimination may get under the

skin among African Americans with different racial identity attitudes and in the context of both blatant and subtle or ambiguous racial stressors.

Limitations of the Present Study and Directions for Future Research

There are several key limitations of the present study that may help to inform future studies of racial discrimination and its processes and consequences. With respect to the sample, I recruited a lot fewer participants than I had hoped. It was very difficult to recruit participants as African American college students and other underrepresented students of color are generally very difficult to recruit at predominantly white institutions. Additionally, 40% of the students who were interested in participating in the present study were ineligible as they had already participated in another experiment that I had already conducted or was simultaneously conducting. As a result of the small sample size, there may been issues of power that made the data less amenable to repeated measures and hierarchical linear modeling statistical tools that are useful for examining change over time. Moreover, the power issues may have made some of findings inconclusive. Future studies using a similar paradigm and design should aim to recruit more participants to maximize power.

A second limitation of the present study is that it is limited with regard to external validity. First, the sample only included African American women. According to several scholars, there are differences in the kinds of racial discrimination events that African American women and men experience as well as their responses to these events (Evans, 2011; Greer et al., 2009; Purdie-Vaughns & Eibach, 2008). As such, the review of the findings for the various consequences and processes may not be able to be generalized to African American male college students or African American men more generally. In order to minimize issues related to external validity, however, I took care to select a racial hassle or microaggression that is equally likely to

be experienced by African American/Black women and men. Second, the sample did not include non-college student samples. As such the findings of the present study may not be generalizable to non-college student populations and older adults. Specifically, it is possible that the findings for the various consequences and processes may not be able to be generalized to older adults with different racial discrimination experiences and different health statuses.

A third limitation of the present study is that the laboratory paradigm was more blatant or presented more race-based situational cues than I anticipated. Specifically, approximately 80 percent of the participants attributed the laboratory event's occurrence to racial discrimination. As such, there was less variability in how the event was experienced than I had hoped.

A fourth limitation of the present study concerns the measurement of causal attributions and cognitive appraisals. Specifically, these factors were not assessed in the moment or on day 1 as doing so would have essentially served as a debriefing or partial debriefing for participants and made the inclusion of the second experimental session moot. Similarly, I was not able to assess participants' causal attributions and cognitive appraisals at multiple time points as I had hoped. This would have been ideal as it would have provided a stellar examination of the potentially dynamic nature of individuals' interpretative processes in the face of racial discrimination. It is worth noting, however, that causal attributions predicted all of the constructs or variables with the exception of the physiological activity raw scores, potentially suggesting that these processes did indeed occur on day 1, as expected. Future studies should attempt to develop clever ways of capturing the interpretative processes in the moment (e.g., right after the event occurs) as well as over time.

A final shortcoming of the present study is that I was unable to assess participants' emotional and physiological activity once they left the laboratory on day 1 and before they came

into the laboratory on day 2. As a result, I have not fully captured participants' responses and the ways in which these responses may have evolved. Attaining participants' nighttime physiological data, particularly their blood pressure activity, would have been ideal as racism may be associated with ambulatory nocturnal blood pressure (Brondolo et al., 2008). Moreover, scholars argue that elevated nocturnal blood pressure levels among African Americans may be a result of anticipatory stress and hypervigilance in face of racism (Williams & Mohammed, 2009). In order to remedy the aforementioned measurement concerns, future studies can combine the laboratory approach used in the present study with the 24-hour ambulatory blood pressure monitoring approach. Specifically, participants could experience a racial discrimination event in the laboratory while they are outfitted with an ambulatory blood pressure machine. Upon leaving the laboratory on day 1, the participants could remain outfitted with ambulatory monitor until the following morning. Upon waking on the subsequent day, participants could remove the ambulatory monitor, report to the laboratory to answer questions about their experience, and then be debriefed. Although challenging, this hybrid design can provide a great deal of data and insight with regard to racial discrimination and the processes and mechanisms by which racial discrimination gets under the skin.

Empirical, Theoretical, and Clinical Contributions

Empirical Contributions

The present study makes several important empirical, theoretical, and clinical contributions. In the empirical vein, the present study builds upon previous studies of racial discrimination by investigating how African Americans interpret and respond to a racial discrimination event that actually occurs in the laboratory. Many researchers who examine specific instances of racial discrimination in the laboratory often instruct African American

participants to imagine that they are being racially discriminated against using vignettes (e.g., Shelton & Sellers, 2000), film clips (Armstead et al., 1989), and guided imagery or speech tasks (e.g., Guyll et al., 2001). Although these approaches provide useful insights, they may not be ideal as there are likely to be discrepancies between how individuals think they will emotionally and behaviorally respond to a hypothetical situation that lacks contextual details and their actual emotional and behavioral responses to the actual situation (Baumeister, Vohs, & Funder, 2007). Furthermore, participants who view film clips that depict racial discrimination are presumably experiencing vicarious forms of racial discrimination, not direct forms of racial discrimination. Collectively, these approaches may lack ecological validity and limit our ability to generalize the study findings to racial discrimination that occurs in the real world. The present study sets the stage for future studies to further investigate specific instances of racial discrimination that individuals actually experience in the laboratory.

Another empirical contribution of the present study is that it focuses on the processes that underlie experiences of racial discrimination as a process. A major limitation of existing studies is that many do not examine the processes that explicate the link between racial discrimination and its negative outcomes. To date, many studies of racial discrimination characterize racial discrimination experiences as stressors to which African Americans have been exposed and do not capture the underlying experience of racial discrimination. Specifically, researchers expose participants to race-related stimuli or analogues and often examine their emotional and/or physiological responses. In doing so, these researchers do not capture the ways in which the participants interpreted the stimuli, probe the variability in participants' responses, or shed light on the complex processes that may be at play. To address this concern, I assessed participants': 1) causal attributions to understand how they experienced the event; 2) their cognitive appraisals

to further understand how they interpreted or cognitively processed the event; 3) racial identity to capture the variability in participants interpretations and responses; 4) rumination to understand how they experienced the event after the cessation of the stressor; and 5) emotional and physiological responses to understand how they were impacted by the event.

A third, notable empirical contribution of the present study is that it examined how African American college students responses' to a specific instance of racial discrimination unfolded over time. To my knowledge, this is the first study that has examined how individuals experience and respond to a laboratory race-based stressor over a 2-day period. Many studies examine racial discrimination at one time point, making it difficult to tease apart the causal order in the association between racial discrimination and its physiological or psychological consequences. While laboratory experimental studies may provide important clues to the factors that influence physiological and psychological responses to racial discrimination, these studies are also limited in their ability to elucidate the long-term effects of racial discrimination. For instance, physiological (e.g., cardiovascular reactivity) and psychological (e.g., rumination) responses to racial discrimination may continue to evolve once the participant has left the laboratory. One of the few models with an explicit focus on racial discrimination and health, Clark and colleagues' (1999) biopsychosocial model of racism, suggests that exaggerated psychological and physiological "fight or flight" processes are initiated when African Americans perceive that an event is racially discriminatory. McEwen and Seeman (1999) and others have noted that individuals' responses to a negative event may take place long after the actual event; thus, it is critical that we examine individual differences in recovery to truly understand how racial discrimination leads to "wear and tear" over time.

Theoretical Contributions

In the theoretical vein, the present study sheds some light with regard to whether racial discrimination is experienced similarly or differently from non-race-related stressors. The findings from the present study suggest that African Americans may indeed respond to racial discrimination and non-race-related stressors differently. Specifically, the African American college students who made greater attributions of race-based discrimination reported feeling more anger, tension, and depressive affect shortly after the event occurred than the African American college students who experienced the event as being less racially discriminatory or not racially discriminatory at all. Moreover, the African American college students who made greater attributions of race-based discrimination experienced larger increases in their heart rate from baseline on day 1 to day 2 and larger decreases in their diastolic blood pressure. These findings, overall, are largely consistent with those of Hoggard and Sellers (in prep), a laboratory experiment wherein an Experimenter denies an African American participant an opportunity to win an iPod and instead grants this opportunity to a confederate – White or African American/Black – posing as a participant. Specifically, the researchers found that the African American college students assigned to the conditions – blatantly racist and ambiguously racist – in which the White confederate won the iPod reported feeling more upset and distressed than participants in the condition in which the African American/Black confederate won the iPod. The findings from the present study also reveal that the individuals who made greater attributions of race-based discrimination appraised the event as being more bothersome and stressful than those who rated the event as being less racially discriminatory or not racially discriminatory all.

In contrast, the present findings are inconsistent with those of a recent daily diary study in which African American college students appraised the race-related and non-race-related

stressors that occurred in their lives as being equally taxing and stressful (Hoggard et al., 2012). One potential reason for the discrepancy between the findings of these two studies is that the present study is a laboratory experiment in which all participants experienced the same event with the only difference being the race of the confederate. The participants in the daily diary study, on the other hand, experienced a number of different race-related (e.g., being followed around in a department store, waiting for extended period of time to be serviced by a store clerk, etc.) and non-race-related stressors (e.g., trying to complete a paper by a particular deadline; conflict with a significant other, etc) that differed in many ways (i.e., duration, context, etc.). Finally, the findings from the present study reveal that individuals who made greater attributions of race-based discrimination reported ruminating about the event more than those who rated the event as being less racially discriminatory or not racially discriminatory all. This finding is very much consistent with Hoggard and colleagues' (2012) finding that the African American college students were more likely to engage in ruminative coping for the race-related events that occurred in their lives than they were for the non-race-related events.

A second theoretical contribution of the present study is that it was framed around stress theory and potentially contributes to the field's understanding of how theorized stress processes and factors operate in the context of racial discrimination. A number of researchers have utilized Lazarus and Folkman's (1984) transactional stress, appraisal, and coping model as a conceptual foundation for understanding how individuals experience racial discrimination and race-related stress (e.g., Clark et al., 1999; Harrell, 2000; Outlaw, 1993; Sellers et al., 2001). Indeed, a critical component of Lazarus and Folkman's model is the emphasis placed on adopting a phenomenological approach to understanding stress wherein the researcher takes the point of view of the individual experiencing the event. In doing so, the researcher can determine the

extent to which the particular event is stressful to the individual. In addition, Lazarus and Folkman (1984) acknowledge that there are situational and person-related differences in how individuals interpret and respond to any single event. As such, researchers have also employed Lazarus and Folkman's model of stress, appraisal, and coping (1984) to examine how characteristics of the person and characteristics of the situation determine whether an individual will experience an event as race-related as well as how an individual will respond given such an assessment (e.g., Byrd, Hoggard, & Sellers, in prep; Clark et al., 1999; Harrell, 2000; Hoggard & Sellers, in prep; Sellers et al., 2001).

The phenomenological perspective theorized by Lazarus and Folkman (1984) was employed in the present study to understand the process by which African American college students interpreted and responded to the event. Notably, the findings of the present study reveal that there was some variability (although not much) in the ways in which the African American college students experienced the event. Moreover, there was variability in how the individuals responded to the event. As reviewed above, individuals who experienced the event as racially discriminatory experienced more negative emotions, appraised the event more negatively, and ruminated about the event more.

The findings of the present study also provide support for the importance of situational and personal factors as theorized by Lazarus and Folkman (1984). Although the findings for the present study reveal there were no significant main effects or interactions for the interplay of race-based situational cues and racial identity predicting causal attributions of race-based discrimination, these findings may not be conclusive. As aforementioned, the sample size was quite small and therefore likely presented issues related to power. The examination of the interplay between race-based situational cues and racial identity may be better undertaken using

data with many more participants. Race-based situational cues did, however, predict participants' responses to the laboratory event such that individuals in the White confederate condition reported more anger and experienced more elevated heart rate and blood pressure. Furthermore, racial identity interacted with causal attributions of race-based discrimination to predict how participants responded to the event. Specifically, the participants who experienced the event as being less racially discriminatory or not racially discriminatory at all and who are highly race central reported feeling the most tension approximately 7-9 minutes after manipulation. Again, this finding may suggest that these individuals had difficulty developing an explanation, in the moment, for their being treated as if they are intellectually inferior. It is important to note that these individuals also reported feeling the happiest on day 2 suggesting that experiencing racial discrimination is indeed a process wherein key racial discrimination factors and racial discrimination responses may change.

Collectively, the findings provide support for many of the factors and processes highlighted by Lazarus and Folkman in their theory of stress, appraisal, and coping (1984) and Sellers and colleagues in their application of the stress, appraisal, and coping theory to the examination of racial discrimination (Sellers et al., 2001). Specifically, the study findings illustrate the importance of the attributional and appraisal processes as key factors that are central to the psychological experience of racial discrimination. Moreover, the study findings illustrate the importance of examining the interplay or transaction between situational and person-related factors as determinants of the psychological experience of an event. Finally, the findings clearly depict the very complex nature of racial discrimination and the ways in which it may lead to negative psychological and physiological outcomes for African Americans.

A third and final theoretical contribution of the present study is that it builds upon the field's understanding of allostatic load theory, particularly in the context of racial discrimination. Allostatic load has been defined as the "wear and tear" the body experiences after repeatedly adapting to stressors (McEwen & Seeman, 1999). Although the present study participants reported feeling the most anger and depressive affect shortly after the manipulation and participants' diastolic blood pressure activity during the manipulation and for the 5 minutes immediately following the manipulation were consistent with a fight or flight response, the participants continued to respond negatively beyond this time period. Specifically, the African American college students' diastolic blood pressure was at its peak at the post-manipulation 1 and 2 time points, 7-11and 12-16 minutes after the manipulation, respectively. These statistics indicate that the event was not only experienced negatively in the moment. Instead, the African American college students experienced the events for substantial amounts of time following the cessation of these events. Moreover, the findings reveal that individuals who experienced the event as being more racially discriminatory had lower diastolic blood pressure responses (although higher diastolic blood pressure responses were expected) approximately 12-16 following the manipulation and higher heart rate responses on the following day. These findings suggest that responses to race-related stressors can persist or intensify over time.

Clinical Contributions

In the clinical vein, the present study has the potential to make several contributions. Again, a notable finding is that racial discrimination may be experienced more negatively than non-race-related stressors (Harrell, 2000; Sellers et al., 2001). This finding is of particular importance as several of the participants reported experiencing racial discrimination frequently in their real lives. Moreover, race-related stress has been identified as a unique source of chronic

worry for African Americans, more broadly (Rucker, West, & Roemer, 2009). Indeed, one participant in the present study reported that she meets with a mental health professional regularly to get assistance in managing the race-related stressors that she encounters on campus. Furthermore, depression and anxiety disorders are relatively prevalent on college campuses. The findings reviewed here suggest that it is important for mental health professionals to carefully probe African American college students for their diverse experiences – both race-related and non-race-related – and provide culturally sensitive and comprehensive therapy and counseling. According to Harrell (2000), "mental health practitioners have had little systematic guidance in exploring the multiple ways that racism may influence their clients' well-being" (Harrell, 2000, p. 42). Another major finding was that racial identity had implications for participants' tension/anxiety and happiness responses depending on the extent to which they made causal attributions of race-based discrimination. As such, it may also be important and helpful for clinicians to ask participants about their worldviews and racial identity attitudes when providing counseling and therapy for racial discrimination events. A final notable finding was that the African American college students' responses depended on whether they interacted with the White or African American confederate. This finding suggests that it is also important for clinicians and counselors to probe their African American clients for information about the race of perpetrator, particularly since ingroup and outgroup racial discrimination experiences are associated with seemingly different responses. In doing so, mental health professionals will be able to contextualize the experience and presumably be better able to respond with the appropriate level or the appropriate kind of service.

The finding also has a number of contributions with regard to physical health outcomes. A major contribution in this regard is the ability of the present study to speak to the ways in

which racial discrimination may implicate Black-White physical health disparities in the United States. One potential mechanism by which racial discrimination may implicate racial health disparities is by contributing to the *number* of stressors that African American individuals encounter. Indeed, African Americans are burdened with race-related stressors – although White Americans are less likely to have these experiences (Guyll et al., 2001; Kessler et al., 1999) – as well as the stressors that are commonly experienced by all individuals (e.g., financial stressors, familial stress), regardless of race. As such, African Americans may experience *more* stressors than their White counterparts.

A second mechanism may be that racial discrimination and other kinds of race-related stress are unique or distinct kinds of life stressors (Banks et al., 2006; Harrell, 2000).Specifically, racial discrimination and race-related stressors may be experienced more *intensely* than non-race-related stressors. The findings of the present study provide support for this notion as they suggest that the African American participants who make greater attributions of race-based discrimination experienced more negative outcomes and physiological activity across both days.

Another important finding from the present study is that African Americans may experience ingroup and outgroup racial discrimination although outgroup discrimination is seemingly experienced more negatively. Specifically, the participants in the White confederate condition exhibited higher diastolic blood pressure than the participants in the African American confederate condition both during the manipulation (marginally) and during the 5-minute spontaneous rumination period that immediately followed the manipulation. Although seemingly negligible, the findings suggest that experiencing racial discrimination by a White perpetrator comparatively triggers a larger SNS response that results in large amounts of pressure being exerted on the walls of the blood vessels when the heart is at rest. Over time, the excessive

pressure on the vessel walls can lead or contribute to the deterioration of the walls of these blood vessels. Importantly, some researchers argue that diastolic blood pressure is more predictive of coronary failure among young adults whereas SBP is more predictive for older/middle age adults (Franklin, Larson, Khan, Wong, Leip, Kannel, & Levy, 2001; Kannel, Gordon, & Schwartz, 1971). Therefore, it is likely that experiencing racial discrimination over and over again across the lifespan can lead or contribute to various health complications, including hypertension, atherosclerosis (clogging of the arteries), and other diseases. Moreover, participants assigned to the White confederate condition had comparatively higher heart rate on day 2 of the experiment. It is also important to note that the mean heart rate of these individuals during the 10-minute period on day 2 is somewhat consistent with a state of fight or flight. These findings suggest that being discriminated against by White perpetrators over time can lead or contribute to altered set points and dysregulation, increased heart rate and variations in normal heart rhythms (e.g., arrhythmia), and various other cardiovascular and immune complications and disease.

A third and final mechanism is that the impact or consequences of racial discrimination are not *momentary* and may contribute to negative downstream consequences. Indeed, racial discrimination experiences may be positively associated with daily levels of anger and depressive symptoms – both at the level of the event and the aggregate level – as well as the intensity of individuals' ratings of routine social interactions as harassing, exclusionary, and unfair (e.g., Broudy et al., 2007; Byrd et al., in prep). Similarly, there is evidence that experiencing ethnic discrimination influences racial and ethnic minorities' perceptions of new situations as threatening and harmful as well as racial and ethnic minorities' physiological responses to new stressors (e.g. public speaking) (e.g., Guyll et al., 2001). Finally, experiencing racial discrimination may lead to hypervigilance regarding the threat of discrimination and the

anticipation of future occurrences (Williams & Mohammed, 2009). This hypervigilance may, in turn, partially account for the finding that African Americans have elevated nocturnal blood pressure levels during sleep (e.g., Brondolo et al., 2008). An interesting finding in the present study was that individuals who experienced the event as being more racially discriminatory experienced greater heart rate activity on day 2, suggesting that these individuals experienced anticipatory stress.

Concluding Statement

The present study was conducted to address the gaps in the extant literature with regard to the processes that explicate the link between racial discrimination and its negative consequences, whether racial discrimination is a unique stressor in the lives of African Americans, and the ways in which responses to racial discrimination events unfold over time. The results of the present study suggest that the ways in which individuals interpret race-related events – both in terms of their explanations for why the events occurred and their assessments of the stressfulness of the events – determine how African American individuals emotionally and physiologically respond to these events in the moment and over time. Moreover, the findings suggest that these factors must be contextualized within the history of race relations in the United States, situational factors, and individuals' attitudes about the meaning and significance of race.

With regard to the distinctiveness of racial discrimination, the findings indicate that African Americans will respond to an event more negatively if it perceived as being race-related or more race-related than if it is not perceived as being race-related or as less race-related. This is a serious cause for concern given the frequency with which African Americans experience racial discrimination events.

Finally, the findings suggest African American individuals' responses to racial discrimination events unfold over time differently based on a number of factors, including the race of perpetrator, individuals' attitudes about race, and the outcome in question (e.g., emotional vs. physiological).

In reflecting upon the findings of this dissertation, I have a few suggestions for researchers and theorists conducting racial discrimination research. First, it is important that researchers closely examine the psychological experience of the victims of racial discrimination. Traditionally, researchers have studied prejudice and stereotyping from the perspective of the perpetrator and have largely ignored the perspective of the victims who are burdened by these phenomena. It is key that researchers not only examine how African Americans respond to racial discrimination but also capture their interpretations and assessments of these events. As aforementioned, the extent to which individuals experienced the event as being race-related determined how they responded both emotionally and physiologically. Therefore, capturing African Americans' psychological experience is imperative.

Second, racial discrimination has a number of consequences and researchers must adopt complex approaches for studying racial discrimination in order to capture these consequences, understand the ways in which these consequences evolve over time, and understand whether these consequences exceed those of non-race-related stressors. To do so, researchers may do well to examine racial identity attitudes, interpretative processes, and individuals' responses to racial discrimination at multiple time points or over time.

Third, in developing racial discrimination interventions, it is important that researchers and counselors recognize that the "one size fits all" approach may not be very effective. As the significance of the causal attribution-cognitive appraisal-outcome mechanisms depended on

individuals' racial identity attitudes, it is likely that the interventions that researchers and counselors develop (e.g., coping interventions) will need to be tailored based on individuals' racial identity attitudes as well as a number of other factors.

Figure 1. Conceptual Model/Heuristic for Racial Discrimination Processes, Mechanisms, and Pathways

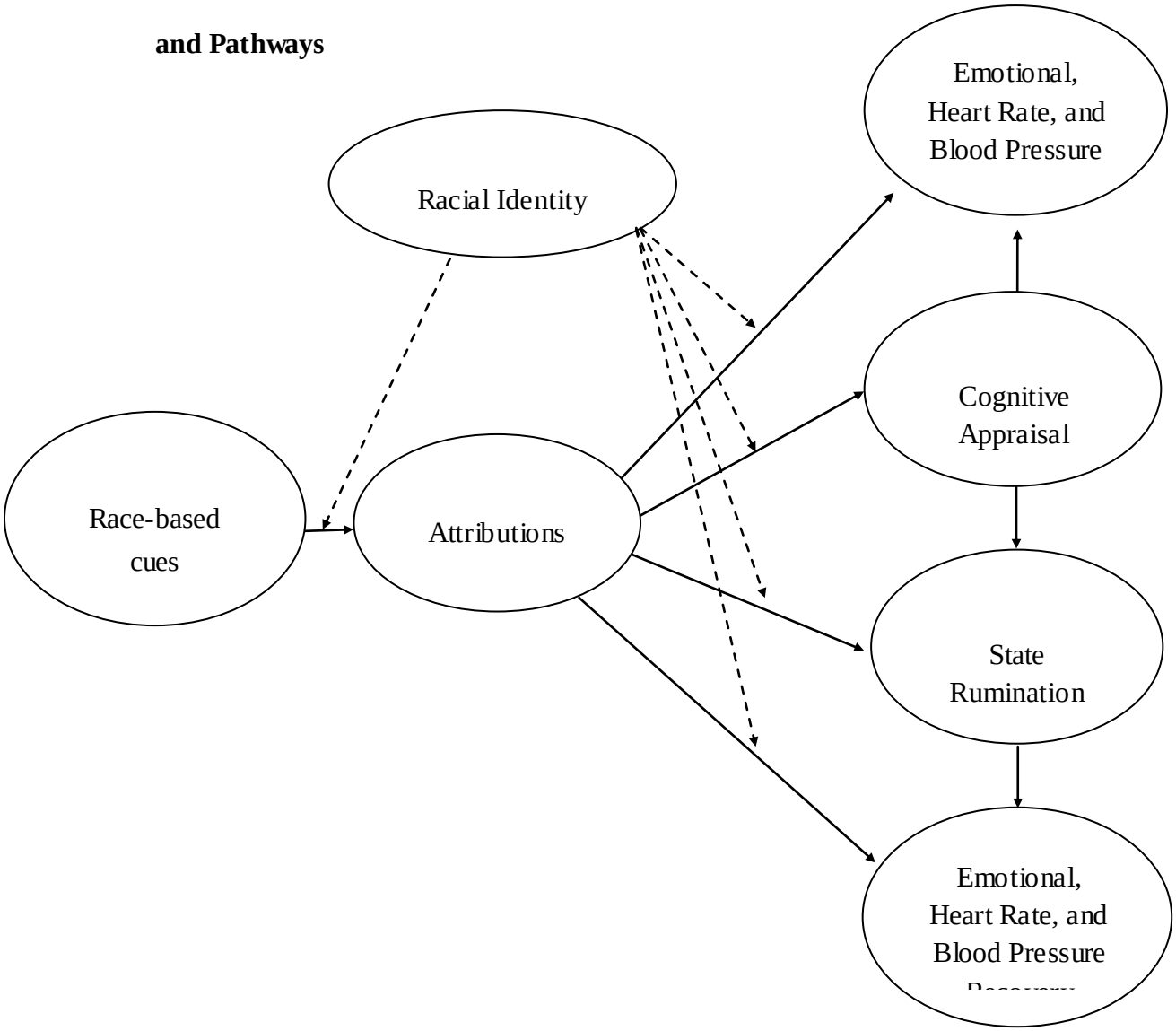


Table 1. Means and Standard Deviations for Demographic Variables and Person Characteristics for Overall Sample and Conditions

	White Condition		*African American Condition*		*Overall sample*	
	(n=23)		*(n=18)*		*(n=41)*	
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
GPA	3.09	.37	3.11	.41	3.10	.38
Centrality	5.61	1.33	5.80	.79	5.69	1.13
Public regard	3.64	1.27	3.47	1.22	3.57	1.23

Note: **GPA=**Grade point average; **Centrality**=Centrality (racial identity); **Public regard**=Public regard (racial identity).

Table 2. Means and Standard Deviations for Causal Attribution Variables for Overall Sample and Conditions

	White Condition (n=23)		*African American Condition (n=18)*		*Overall Sample (n=41)*	
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Race	5.45	1.74	5.27	2.05	5.38	1.85
Physical appearance	4.45	2.13	5.67	1.48	4.95	1.96
Competency	3.64	2.04	4.27	2.52	3.89	2.23
Age	2.73	1.75	2.73	1.67	2.73	1.69
Social class	2.82	1.50	3.40	2.10	3.05	1.76
Gender	2.86	1.93	2.67	1.84	2.78	1.87
Random choice	2.64	1.79	1.93	1.03	2.35	1.55

Note: **Race=**Race-based causal attributions; **Physical appearance**=Physical appearance-based causal attributions; **Competency**=Competency-based causal attributions; **Age**=Age-based causal attributions; **Social class**=Social class-based causal attributions; **Gender**=Gender-based causal attributions; **Random choice=**Random choice-based causal attributions.

Table 3. Means and Standard Deviations for Cognitive Appraisal Variables for Overall Sample and Conditions

	White Condition		*African American Condition*		*Overall sample*	
	(n=23)		*(n=18)*		*(n=41)*	
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Bother	2.59	1.18	2.87	1.13	2.70	1.15
Stressful	2.23	.92	2.27	1.03	2.24	.95
Something to lose	1.45	.51	1.47	.74	1.46	.61

Note: **Bother**=Bothersome appraisals; **Stressful**=Stressful appraisals; **Something to lose**=Appraisals of what have to lose.

Table 4. Means and Standard Deviations for Rumination Variables for Overall Sample and Conditions

	White Condition		*African American Condition*		*Overall sample*	
	(n=23)		*(n=18)*		*(n=41)*	
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Intrusion	1.53	.62	1.75	.73	1.62	.66
Avoidance	1.81	.76	1.68	.55	1.76	.68
Thought about event	2.09	.87	1.93	.88	2.03	.87

Note: **Intrusion**=Extent to which had intrusive thoughts; **Avoidance=**Extent to which tried to avoid thinking about event; **Thought about event**=Extent to which thought about the event.

Figure 2. Anger at 4 Time Points

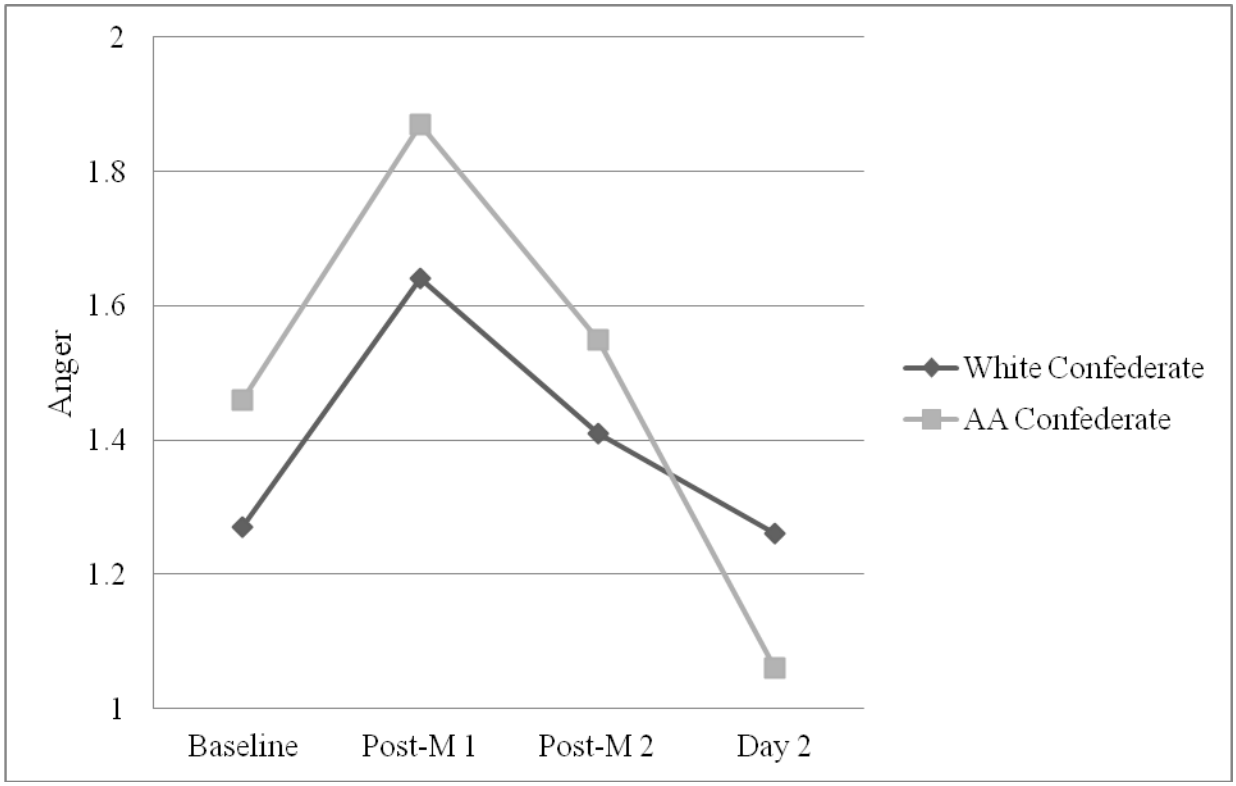


Figure 3. Depressive Affect at 4 Time Points

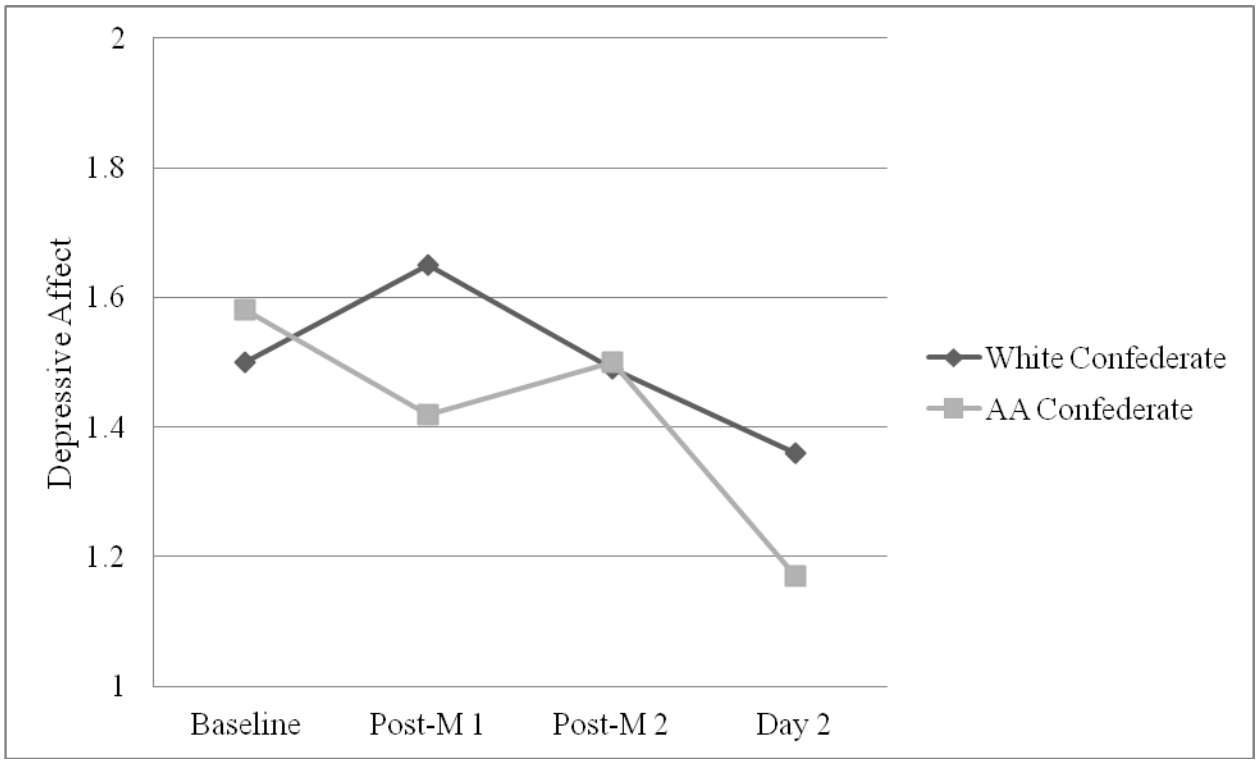


Figure 4. Tension at 4 Time Points

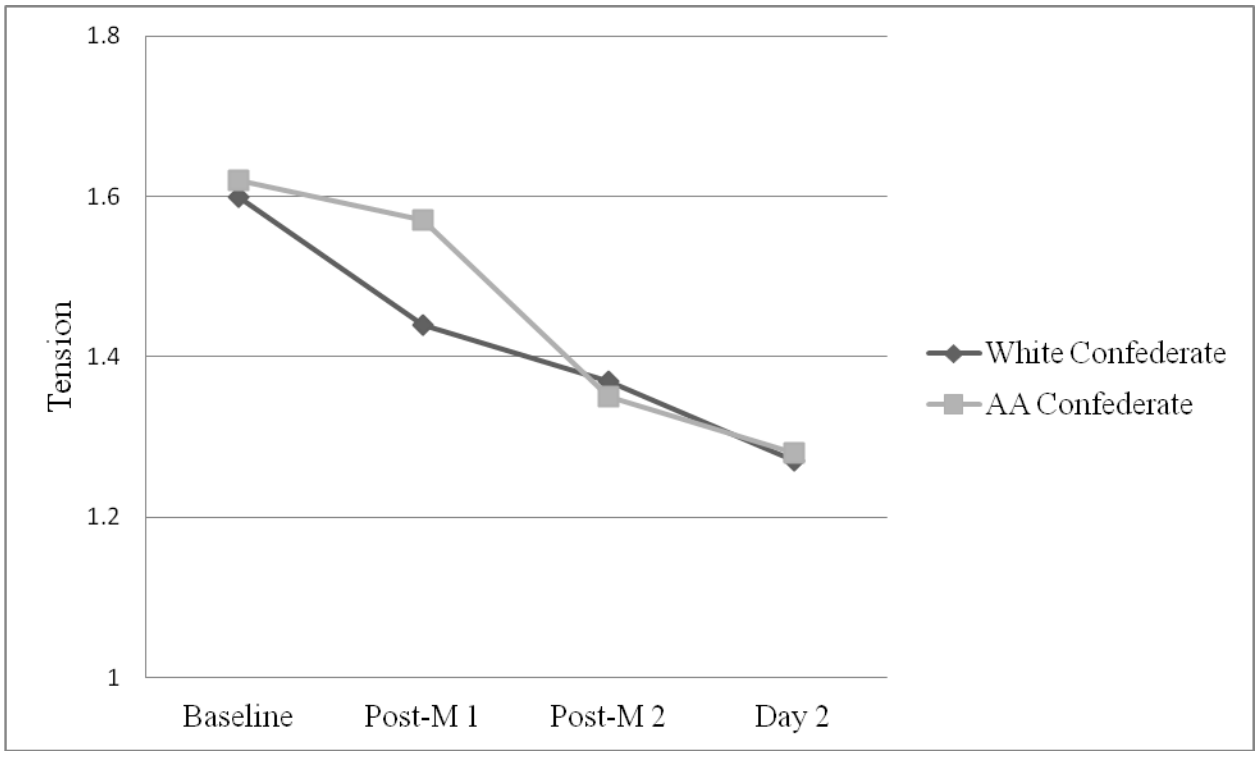


Figure 5. Happiness at 4 Time Points

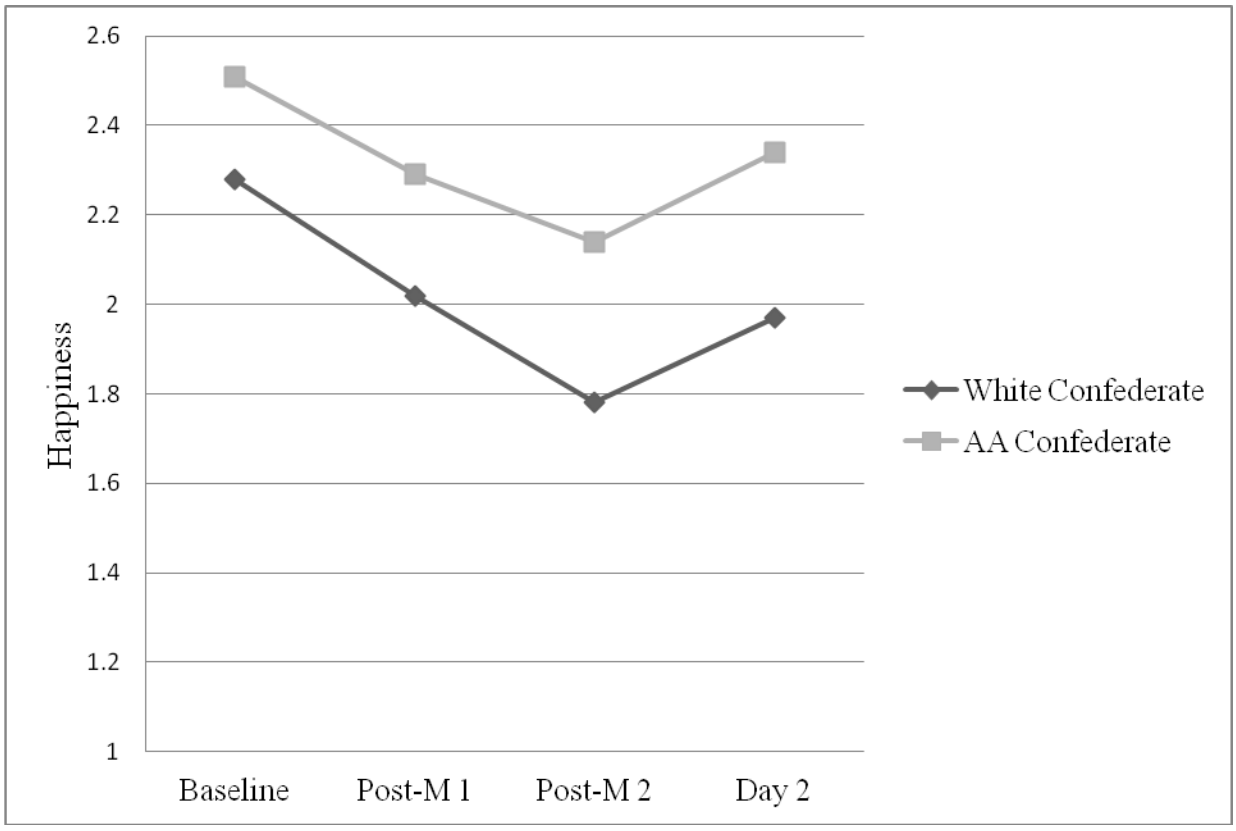


Figure 6. Heart rate at 7 Time Points

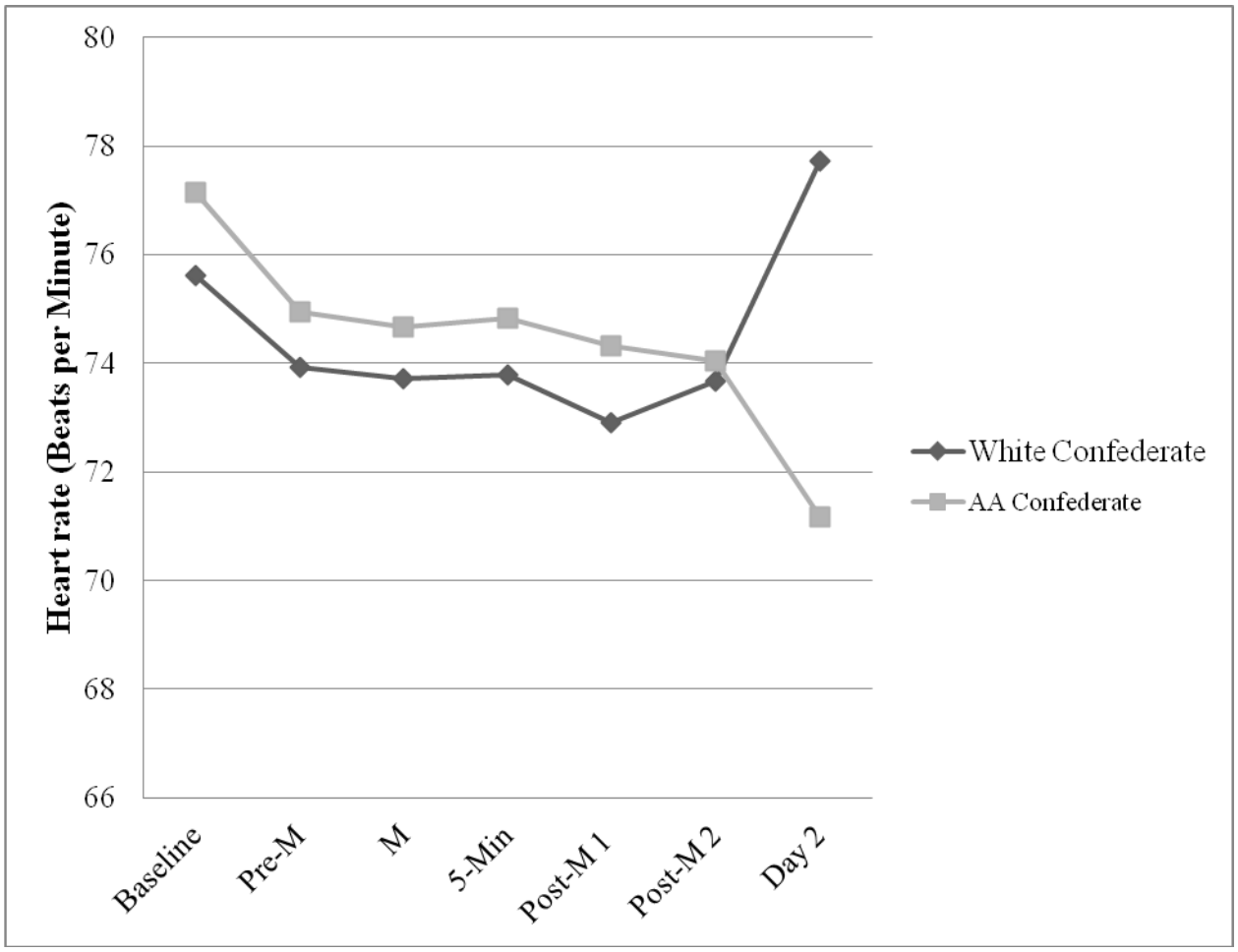


Figure 7. Systolic blood pressure at 7 Time Points

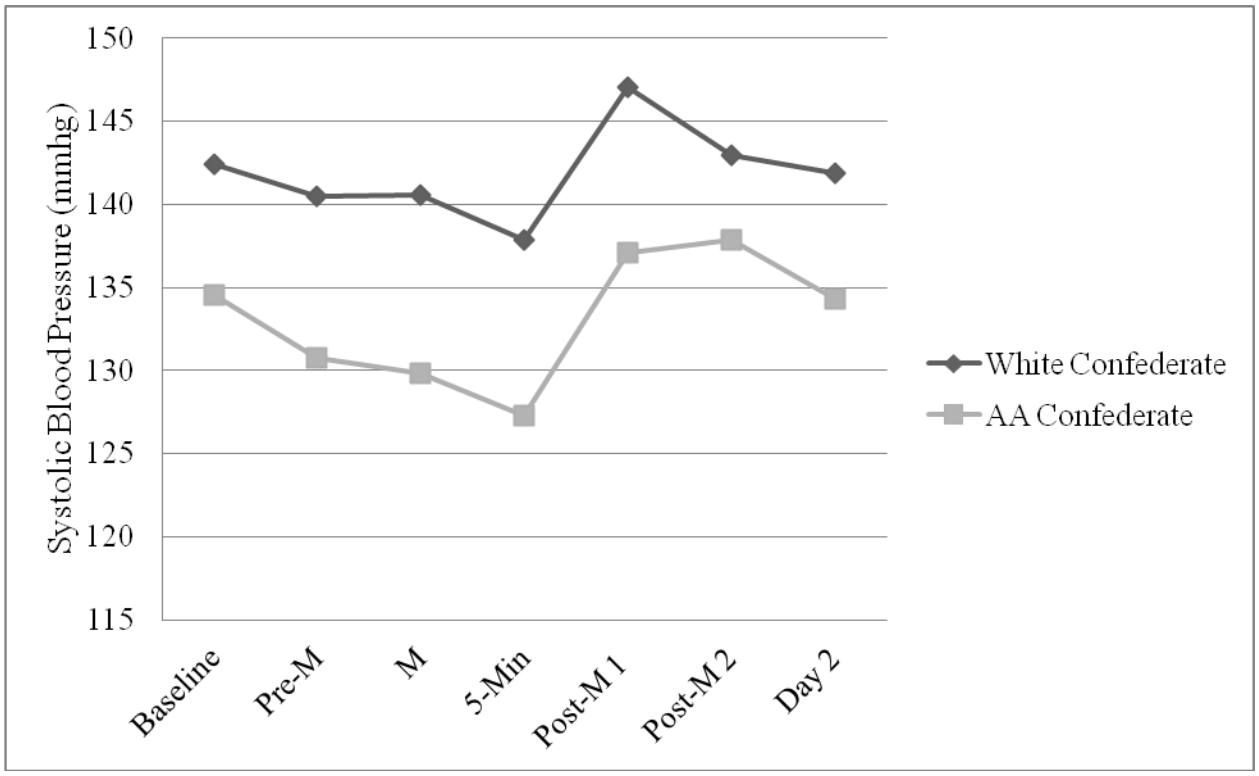


Figure 8. Diastolic blood pressure at 7 Time Points

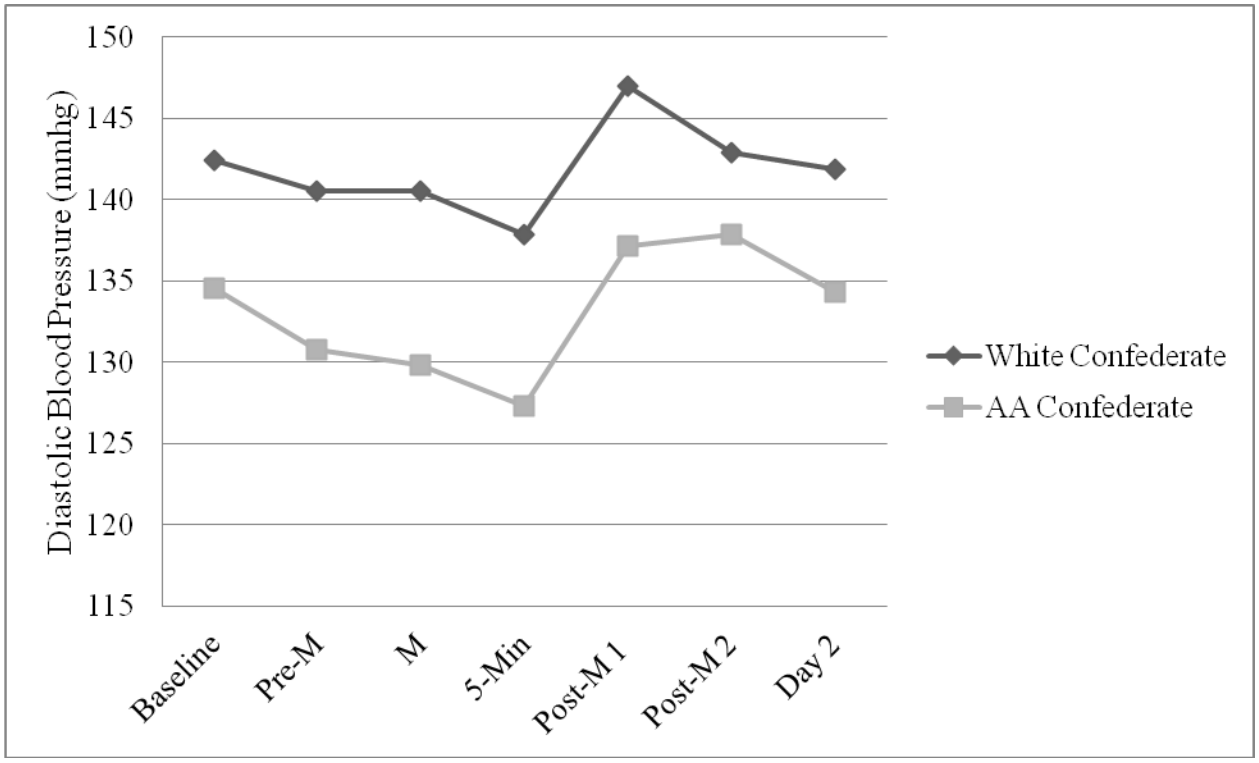


Figure 9. Mean Arterial blood pressure at 7 Time Points

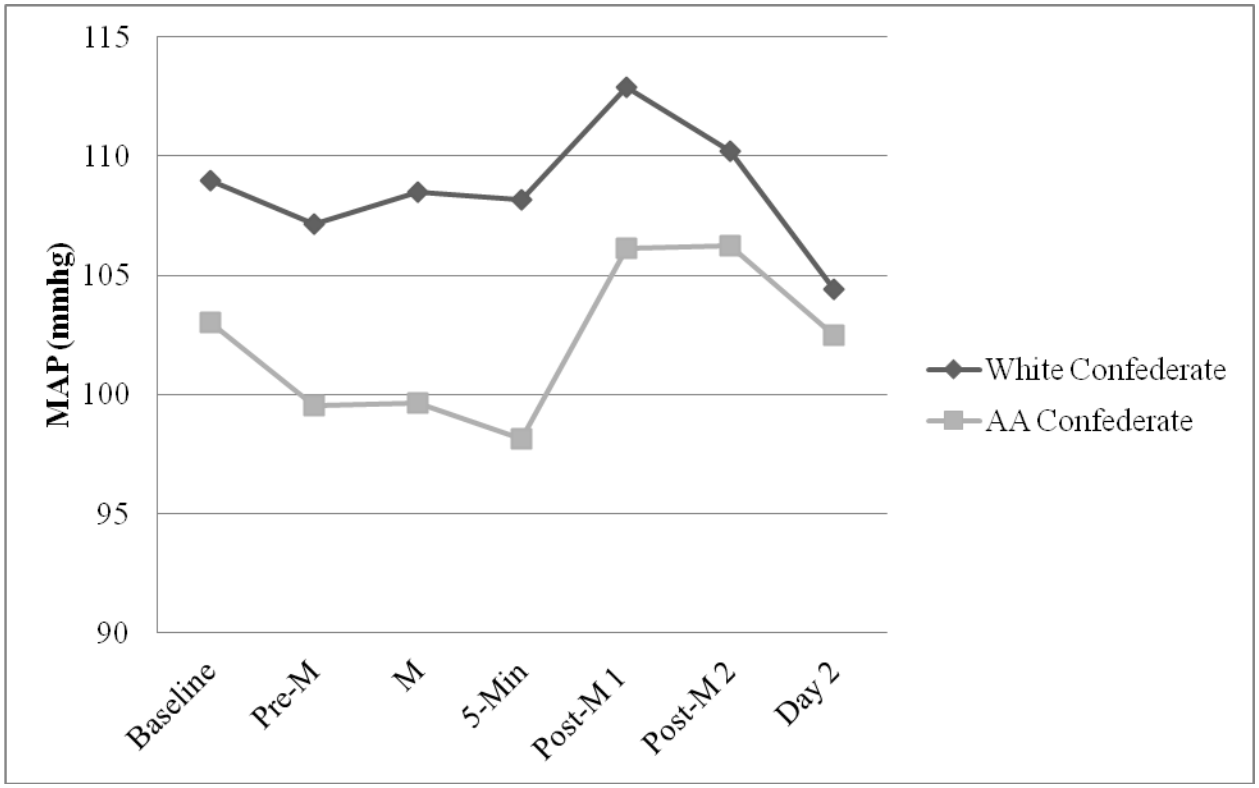


Table 5. Intercorrelations among Causal Attribution Variables

	1.	2.	3.	4.	5.	6.	7.	8.
1. Race	-							
2. Physical appearance	**.30+**	-						
3. Competency	.05	.27	-					
4. Age	.11	.10	-.10	-				
5. Social Class	.21	.13	**.43****	-.08	-			
6. Gender	.14	-.06	-.06	**.44****	.11	-		
7. Random choice	**-.42****	-.17	-.12	.14	-.21	.19	-	
8. Not sure	-.12	.04	**-.32+**	.20	-.25	.10	**.38***	-

Note: **Race=**Race-based causal attributions; **Physical appearance**=Physical appearance-based causal attributions; **Competency**=Competency-based causal attributions; **Age**=Age-based causal attributions; baseline; **Social class**=Social class-based causal attributions; **Gender**=Gender-based causal attributions; **Random choice=**Random choice-based causal attributions; **Not sure=**Not sure with regard to particular causal attributions.

+p<.10; *p<.05; **p<.001

Table 6. Intercorrelations among Emotion Variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1. BL Anger	-															
2. BL Dep	.73**	-														
3. BL Tension	.27+	.30+	-													
4. BL Hap	-.14	.01	-.06	-												
5. PM 1 Anger	.25	.25	.35*	-.03	-											
6. PM 1 Dep	.29+	.56**	.33*	-.15	.89**	-										
7. PM 1 Tension	.21	.32*	.55**	.09	.65**	.69**	-									
8. PM1 Hap	.05	.22	.13	.71**	.19	.06	.20	-								
9. PM 2 Anger	.34*	.50*	.32*	-.05	.83*	.73*	.57*	.25	-							
10. PM 2 Dep	.36*	.56**	.36*	-.09	.84**	.87**	.71**	.21	.89**	-						
11. PM 2 Tension	.14	.16	.64*	-.00	.33*	.41**	.78**	.17	.39*	.55**	-					
12. PM 2 Hap	.07	.23	.19	.63*	.28+	.12	.26	.89**	.24	.20	.16	-				
13. Day 2 Anger	.13	.01	.21	-.26	-.07	.11	.35*	-.30+	-.10	.23	.56**	-.23	-			
14. Day 2 Dep	.15	.15	.19	-.18	-.13	.04	.40*	-.24	-.11	.14	.41*	-.18	.76**	-		
15. Day 2 Tension	.00	-.04	.51*	.04	-.08	-.05	.40*	.08	-.13	.07	.67**	.10	.57**	.53**	-	
16. Day 2 Hap	.14	.07	-.15	.57**	-.10	-.12	.12	.62**	-.09	.06	.11	.50**	-.12	-.06	.09	-

Note: **BL anger**=Anger at baseline; **BL dep**=Depression at baseline; **BL tension**=Tension at baseline; **BL hap**=Happiness at baseline; **PM 1 anger**=Anger at post-manipulation 1 time point; **PM 1 dep**=Depression at post-manipulation 1 time point; **PM 1 tension**=Tension at post-manipulation 1 time point; **PM 1 hap**=Happiness at post-manipulation 1 time point; **PM 2 anger**=Anger at post-manipulation 2 time

point; **PM 2 dep**=Depression at post-manipulation 2 time point; **PM 2 tension**=Tension at post-manipulation 2 time point; **PM 2 hap**=Happiness at post-manipulation 2 time point; **Day 2 anger**=Anger on day 2; **Day 2 dep**=Depression on day 2; **Day 2 tension**= Tension on day 2; **Day 2 hap**=Happiness on day 2.

+p<.10; *p<.05; **p<.001

Table 7. Intercorrelations among Heart Rate and Systolic Blood Pressure Variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Baseline heart rate	-													
2. Pre-M heart rate	.93**	-												
3. M heart rate	.81**	.86**	-											
4. 5-Min heart rate	.84**	.88**	.86**	-										
5. Post-M 1 heart rate	.90**	.93**	.93**	.87**	-									
6. Post-M 2 heart rate	.86**	.90**	.90**	.86**	.94**	-								
7. Day 2 heart rate	.49**	.62**	.55**	.57**	.58**	.65**	-							
8. Baseline Systolic	.02	.09	.08	.07	.07	.06	.21	-						
9. Pre-M Systolic	.01	.12	.10	.14	.11	.09	.34	.94**	-					
10. M Systolic	-.03	.08	.01	.11	.09	.09	.34	.94**	.97**	-				
11. 5-Min Systolic	-.09	.02	-.05	.01	.06	.07	.24	.91**	.88**	.94**	-			
12. Post-M 1 Systolic	-.11	.004	.01	.01	.04	.06	.10	.86**	.81**	.81**	.80**	-		
13. Post-M 2 Systolic	-.19	-.11	-.07	-.13	-.07	-.07	.02	.77**	.74**	.72**	.72**	.89**	-	
14. Day 2 Systolic	.03	.07	.13	.01	.01	.13	.45	.41**	.49**	.51**	.52*	.41*	.39*	-

Note: **Baseline heart rate**=Heart rate at baseline; **Pre-M heart rate**=Heart rate at the pre-manipulation time point; **M heart rate**=Heart rate during the manipulation; **5-Min heart rate**=Heart rate during the spontaneous rumination period; **Post-M 1 heart rate**=Heart rate at the post-manipulation 1 time point; **Post-M 2 heart rate**=Heart rate at the post-manipulation 2 time point; **Day 2 heart rate**=Heart rate on day 2; **Baseline Systolic**=Systolic blood pressure at baseline; **Pre-M Systolic**=Systolic blood pressure at the pre-manipulation time point; **M Systolic** = Systolic blood pressure during the manipulation; **5-Min Systolic**=Systolic blood pressure during the spontaneous rumination period; **Post-M 1 Systolic** = Systolic blood pressure at the post-manipulation 1 time point; **Post-M 2 Systolic**=Systolic blood pressure at the post-manipulation 2 time point; **Day 2 Systolic**=Systolic blood pressure on day 2.

*p<.05; **p<.001

Table 8. Intercorrelations among Heart Rate and Diastolic Blood Pressure Variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Baseline heart rate	-													
2. Pre-M heart rate	.93**	-												
3. M heart rate	.81**	.86**	-											
4. 5-Min heart rate	.84**	.88**	.86**	-										
5. Post-M 1 heart rate	.90**	.93**	.93**	.87**	-									
6. Post-M 2 heart rate	.86**	.90**	.90**	.86**	.94**	-								
7. Day 2 heart rate	.49**	.62**	.55**	.57**	.58**	.65**	-							
8. Baseline Diastolic	-.06	.07	.13	.01	.07	.08	.24	-						
9. Pre-M Diastolic	.09	.18	.20	.20	.09	.16	.30	.88**	-					
10. M Diastolic	.06	.17	.18	.21	.11	.15	.21	.86**	.92**	-				
11. 5-Min Diastolic	.02	.15	.14	.20	.11	.15	.17	.80**	.85**	.93**	-			
12. Post-M 1 Diastolic	-.10	-.01	.11	.12	.05	.06	.16	.81**	.72**	.73**	.74**	-		
13. Post-M 2 Diastolic	-.09	.02	.11	.14	.06	.09	.19	.79**	.74**	.69**	.72**	.95**	-	
14. Day 2 Diastolic	.19	.08	.08	.09	.10	.17	.05	-.75**	-.64**	-.67**	-.63**	-.59**	-.62**	-

Note: **Baseline heart rate**=Heart rate at baseline; **Pre-M heart rate**=Heart rate at the pre-manipulation time point; **M heart rate**=Heart rate during the manipulation; **5-Min heart rate**=Heart rate during the spontaneous rumination period; **Post-M 1 heart rate**=Heart rate at the post-manipulation 1 time point; **Post-M 2 heart rate**=Heart rate at the post-manipulation 2 time point; **Day 2 heart rate**=Heart rate on day 2; **Baseline Diastolic**=Diastolic blood pressure at baseline; **Pre-M Diastolic**=Diastolic blood pressure at the pre-manipulation time point; **M Diastolic**=Diastolic blood pressure during the manipulation; **5-Min Diastolic**=Diastolic blood pressure during the spontaneous rumination period; **Post-M 1 Diastolic**=Diastolic blood pressure at the post-manipulation 1 time point; **Post-M 2 Diastolic**=Diastolic blood pressure at the post-manipulation 2 time point; **Day 2 Diastolic**=Diastolic blood pressure on day 2.

$^{**}p<.001$

Table 9. Intercorrelations among Heart Rate and Mean Arterial Pressure (MAP) Variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Baseline heart rate	-													
2. Pre-M heart rate	.93**	-												
3. M heart rate	.81**	.86**	-											
4. 5-Min heart rate	.84**	.88**	.86**	-										
5. Post-M 1 heart rate	.90**	.93**	.93**	.87**	-									
6. Post-M 2 heart rate	.86**	.90**	.90**	.86**	.94**	-								
7. Day 2 heart rate	.49**	.62**	.55**	.57**	.58**	.65**	-							
8. Baseline MAP	-.02	.08	.11	.04	.07	.07	.24	-						
9. Pre-M MAP	.06	.16	.16	.19	.10	.13	.34	.95**	-					
10. M MAP	.01	.13	.10	.17	.11	.13	.29	.95**	.96**	-				
11. 5-Min MAP	-.04	.09	.05	.12	.10	.12	.23	.92**	.89**	.95**	-			
12. Post-M 1 MAP	-.11	-.001	.06	.07	.05	.06	.14	.88**	.81**	.84**	.84**	-		
13. Post-M 2 MAP	-.15	-.04	.03	.02	.002	.02	.11	.82**	.79**	.77**	.77**	.94**	-	
14. Day 2 MAP	.07	.09	.15	.01	.10	.22	.42*	.41**	.42*	.43**	.44**	.37*	.32+	-

Note: **Baseline heart rate**=Heart rate at baseline; **Pre-M heart rate**=Heart rate at the pre-manipulation time point; **M heart rate**=Heart rate during the manipulation; **5-Min heart rate**=Heart rate during the spontaneous rumination period; **Post-M 1 heart rate**=Heart rate at

the post-manipulation 1 time point; **Post-M 2 heart rate**=Heart rate at the post-manipulation 2 time point; **Day 2 heart rate**=Heart rate on day 2; **Baseline MAP**=Mean arterial blood pressure at baseline; **Pre-M MAP**=Mean arterial blood pressure at the pre-manipulation time point; **M MAP**=Mean arterial blood pressure during the manipulation; **5-Min MAP**=Mean arterial blood pressure during the spontaneous rumination period; **Post-M 1 MAP**=Mean arterial blood pressure at the post-manipulation 1 time point; **Post-M 2 MAP**=Mean arterial blood pressure at the post-manipulation 2 time point; **Day 2 MAP**=Mean arterial blood pressure on day 2.

+p<.10; *p<.05; **p<.001

Figure 10. Attributions x Centrality Predicting Tension at the Post-Manipulation 1 Time Point

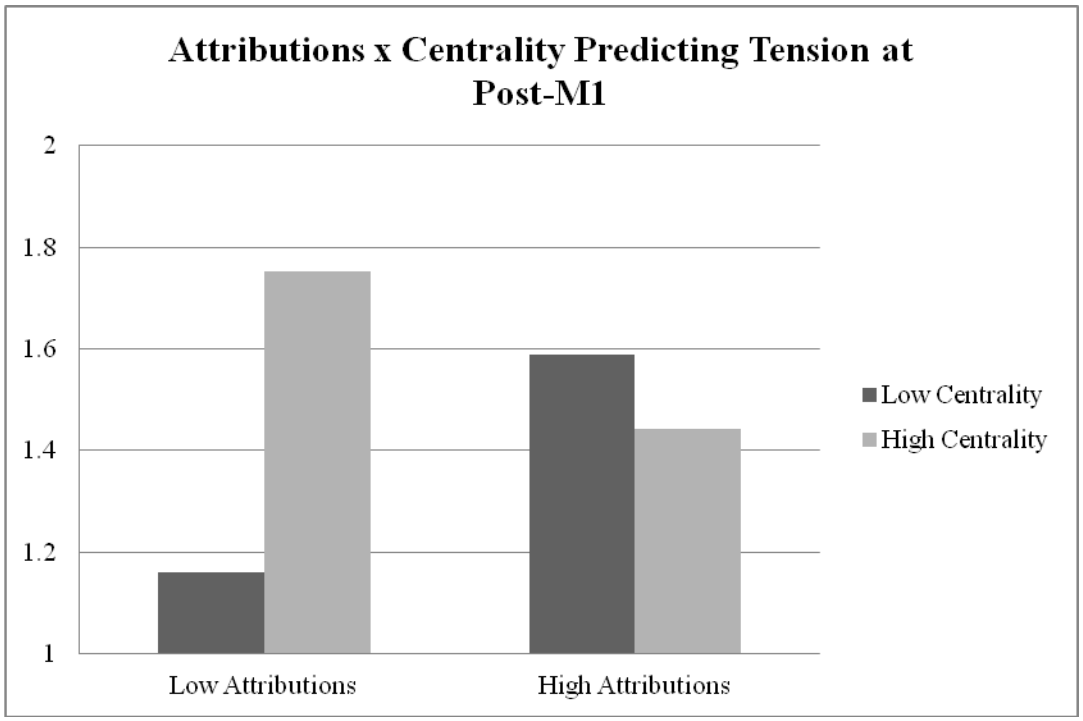


Figure 11. Attributions x Centrality Predicting Happiness on Day 2

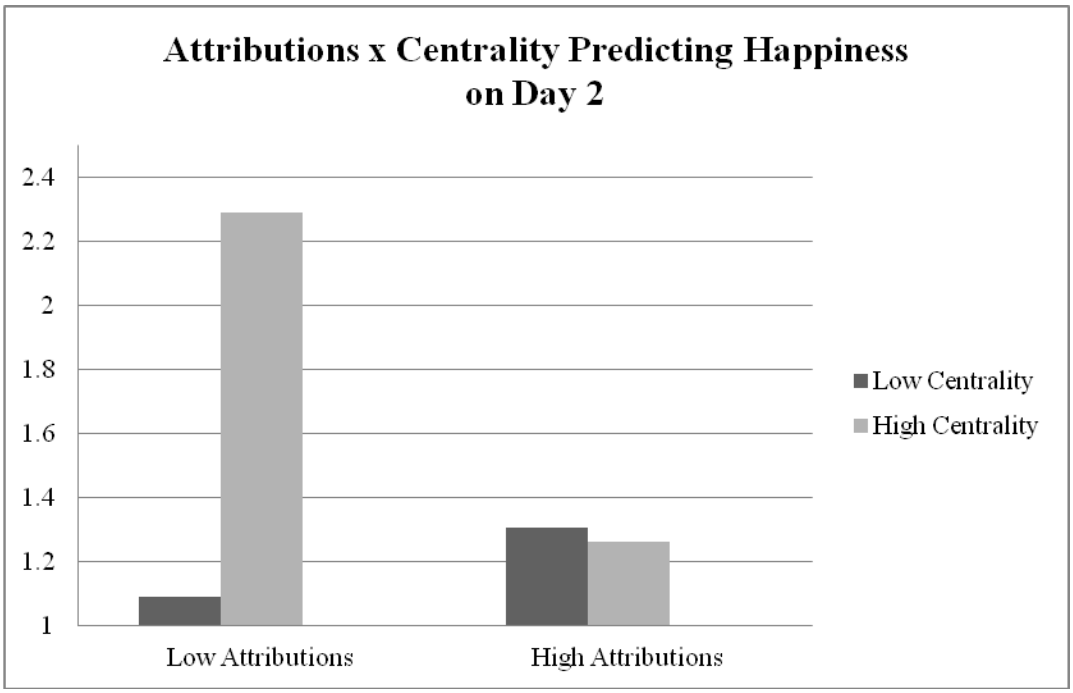


Table 10. Regression results for moderated mediation model of causal attributions of race-based discrimination on tension at the post-manipulation time point through bothersome appraisals, moderated by racial centrality.

Predictor	Coefficient	SE	*t*	*p*
	Bothersome appraisals (mediator variable model)			
Constant	2.717	0.165	16.460	<.001
Race attributions	0.325	0.093	3.518	0.001
Centrality	0.114	0.153	0.745	0.462
Race attributions X Centrality	-0.060	0.102	-0.590	0.560
	Tension at Post-M 1 (dependent variable model)			
Constant	0.985	0.203	4.861	<.001
Bother	0.178	0.071	2.509	0.017
Race attributions	-0.023	0.044	-0.516	0.609
	Conditional Effects at Each Level of Centrality			
	Bootstrap indirect effect	Bootstrap SE	95% CI bias corrected	
Low Centrality	0.070	0.041	(.010, .151)	
Moderate Centrality	0.058	0.032	(.018, .139)	
High Centrality	0.046	0.041	(-.009, .159)	

Table 11. Regression results for moderated mediation model of causal attributions of race-based discrimination on tension at the post-manipulation time point through bothersome appraisals, moderated by public regard.

Predictor	Coefficient	SE	*t*	*p*
	Bothersome appraisals (mediator variable model)			
Constant	2.734	0.158	17.263	<.001
Race attributions	0.293	0.088	3.338	0.002
Public Regard	-0.260	0.131	-1.990	0.055
Race attributions X Public Regard	0.057	0.660	0.856	0.398
	Tension at Post-M 1 (dependent variable model)			
Constant	0.985	0.203	4.861	<.001
Bother	0.178	0.071	2.509	0.017
Race attributions	-0.023	0.044	-0.516	0.609
	Conditional Effects at Each Level of Public Regard			
	Bootstrap indirect effect	Bootstrap SE	95% CI bias corrected	
Low Public Regard	0.040	0.042	(.003, .176)	
Moderate Public Regard	0.052	0.032	(.013, .125)	
High Public Regard	0.064	0.037	(.016, .148)	

Table 12. Regression results for moderated mediation model of causal attributions of race-based discrimination on anger at the post-manipulation time point through bothersome appraisals, moderated by racial centrality.

Predictor	Coefficient	SE	*t*	*p*
	Bothersome appraisals (mediator variable model)			
Constant	2.717	0.165	16.460	<.001
Race attributions	0.325	0.093	3.518	0.001
Centrality	0.114	0.153	0.745	0.462
Race attributions X Centrality	-0.060	0.102	-0.590	0.560
	Anger at Post-M 1 (dependent variable model)			
Constant	1.091	0.407	2.680	0.011
Bother	0.225	0.142	1.581	0.123
Race attributions	0.118	0.089	1.326	0.194
	Conditional Effects at Each Level of Centrality			
	Bootstrap indirect effect	Bootstrap SE	95% CI bias corrected	
Low Centrality	0.089	0.060	(.002, .234)	
Moderate Centrality	0.073	0.048	(.008, .198)	
High Centrality	0.058	0.058	(-.006, .266)	

Table 13. Regression results for moderated mediation model of causal attributions of race-based discrimination on anger at the post-manipulation 1 time point through bothersome appraisals, moderated by public regard.

Predictor	Coefficient	SE	*t*	*p*
	Bothersome appraisals (mediator variable model)			
Constant	2.734	0.158	17.263	<.001
Race attributions	0.293	0.088	3.338	0.002
Public Regard	-0.260	0.131	-1.991	0.055
Race attributions X Public Regard	0.057	0.066	0.856	0.398
	Anger at Post-M 1 (dependent variable model)			
Constant	1.091	0.407	2.680	0.011
Bother	0.225	0.142	1.581	0.123
Race attributions	0.118	0.089	1.326	0.194
	Conditional Effects at Each Level of Public Regard			
	Bootstrap indirect effect	Bootstrap SE	95% CI bias corrected	
Low Public Regard	0.050	0.047	(.002, .205)	
Moderate Public Regard	0.066	0.066	(.002, .173)	
High Public Regard	0.082	0.082	(.003, .240)	

Table 14. Regression results for moderated mediation model of causal attributions of race-based discrimination on heart rate during the manipulation through bothersome appraisals, moderated by racial centrality.

Predictor	Coefficient	SE	*t*	*p*
	Bothersome appraisals (mediator variable model)			
Constant	2.652	0.180	14.720	<.001
Race attributions	0.306	0.097	3.167	0.004
Centrality	0.132	0.162	0.820	0.419
Race attributions X Centrality	-0.0573	0.105	-0.545	0.590
	Heart rate during manipulation (dependent variable model)			
Constant	64.505	4.463	14.454	<.001
Bother	3.499	1.589	2.202	0.036
Race attributions	-0.976	0.962	-1.014	0.319
	Conditional Effects at Each Level of Centrality			
	Bootstrap indirect effect	Bootstrap SE	95% CI bias corrected	
Low Centrality	1.309	0.848	(-.084, 3.163)	
Moderate Centrality	1.070	0.612	(.133, 2.650)	
High Centrality	0.831	0.797	(-.195, 3.459)	

Table 15. Regression results for moderated mediation model of causal attributions of race-based discrimination on tension on day 2 through bothersome appraisals, moderated by racial centrality.

Predictor	Coefficient	SE	*t*	*p*
	Bothersome appraisals (mediator variable model)			
Constant	2.717	0.165	16.460	<.001
Race attributions	0.325	0.093	3.518	0.001
Centrality	0.114	0.153	0.745	0.462
Race attributions X Centrality	-0.060	0.102	-0.590	0.560
	Tension on day 2 (dependent variable model)			
Constant	0.811	0.191	4.241	<.001
Bother	0.168	0.067	2.519	0.017
Race attributions	-0.088	0.042	-2.114	0.042

	Conditional Effects at Each Level of Centrality		
	Bootstrap indirect effect	Bootstrap SE	95% CI bias corrected
Low Centrality	0.066	0.045	(.009, .175)
Moderate Centrality	0.055	0.042	(.010, .174)
High Centrality	0.043	0.054	(-.006, .223)

Table 16. Regression results for moderated mediation model of causal attributions of race-based discrimination on tension on day 2 through bothersome appraisals, moderated by public regard.

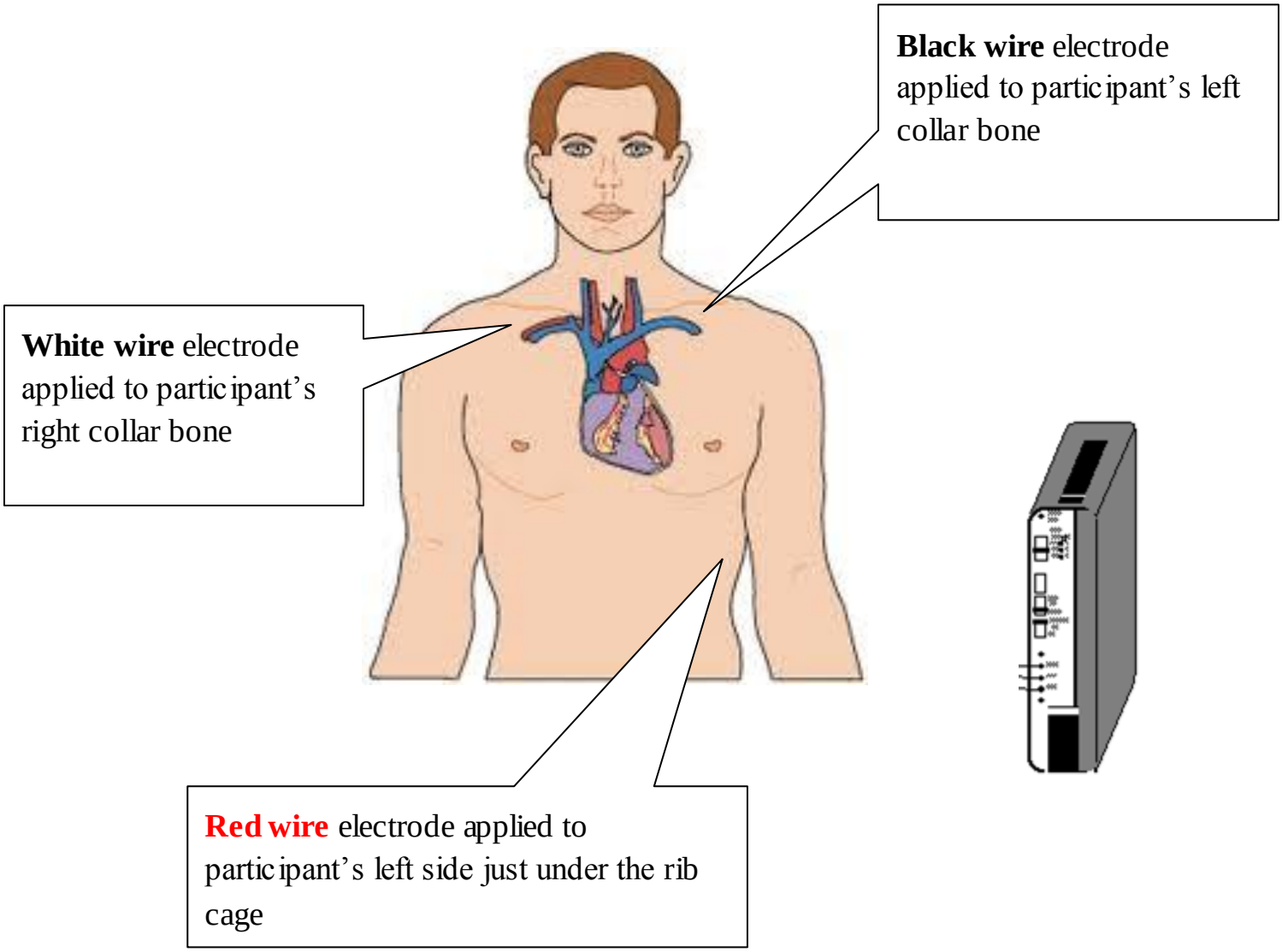
Predictor	Coefficient	SE	*t*	*p*
	Bothersome appraisals (mediator variable model)			
Constant	2.734	0.158	17.263	<.001
Race attributions	0.293	0.088	3.338	0.002
Public regard	-0.260	0.131	-1.991	0.055
Race attributions X Public Regard	0.057	0.066	0.856	0.398
	Tension on day 2 (dependent variable model)			
Constant	0.811	0.191	4.241	<.001
Bother	0.049	0.067	2.519	0.017
Race attributions	0.061	0.042	-2.114	0.042
	Conditional Effects at Each Level of Public regard			
	Bootstrap indirect effect	Bootstrap SE	95% CI bias corrected	
Low Public Regard	0.038	0.047	(.001, .175)	
Moderate Public Regard	0.049	0.040	(.007, .146)	
High Public Regard	0.061	0.045	(.009, .168)	

Table 17. Regression results for moderated mediation model of causal attributions of race-based discrimination on diastolic blood pressure at the post-manipulation 2 time point through bothersome appraisals, moderated by racial centrality.

Predictor	Coefficient	SE	*t*	*p*
	Bothersome appraisals (mediator variable model)			
Constant	2.850	0.182	15.677	<.001
Race attributions	0.277	0.105	2.640	0.014
Centrality	-0.054	0.231	-0.236	0.816
Race attributions X Centrality	-0.099	0.127	-0.781	0.442
	Diastolic blood pressure at post-manipulation 2 (dependent variable model)			
Constant	81.673	7.393	11.048	<.001
Bother	3.513	2.469	1.423	0.166
Race attributions	0.516	1.518	0.340	0.737
	Conditional Effects at Each Level of Centrality			
	Bootstrap indirect effect	Bootstrap SE	95% CI bias corrected	
Low Centrality	1.256	0.926	(-.038, 3.748)	
Moderate Centrality	0.974	0.733	(.104, 3.309)	
High Centrality	0.692	0.836	(-.240, 3.388)	

APPENDIX A

WIRELESS ECG ELECTRODE PLACEMENT DIAGRAM



APPENDIX B

CONTINUOUS BLOOD PRESSURE MACHINE CUFF PLACEMENT

Blood pressure upper arm cuff placed about ½ inch to an inch between cuff and crease in elbow on non-dominant arm

Blood pressure finger cuffs are placed on the proximal joints of the finger

APPENDIX C

STREAM OF THOUGHTS DIARY CODING SCHEME AND PARTICIPANT DIARIES

Instructions: For each participant's response, score all of the following.

Participant ID: This is the 9 digit number.

Is response CODABLE (CODBL1): Is the diary reasonably legible and coherent? If so, score it as CODABLE. If the response is not reasonably legible and coherent, score as NOT CODABLE.

0 NO
1 YES

 # OF WORDS: Just count the number of words. Then enter the exact number. Words that have been crossed out by the participant should not be included in the word count.

TALKED ABOUT INTERRUPTION/INTERACTION? Did the participant write anything about the interaction or interruption?

0 NO
1 YES

STREAM OF THOUGHTS DIARIES

Participant ID: 111203001

Day 1
Pre-Manipulation Diary Response:
I'm wondering why the last question asked if I was left-handed, and what this has to do with the cardiovascular system. Also, I find it doubtful that anyone would answer 'ambidextrious'. I have never met anyone who can write with both hands.

Post-Manipulation Diary Response:
This morning I was feeling very emotional, easily upset, etc. I'm feeling much better now, but I'm hungry. Still a little 'down' but I think once I eat and take the exam I have later today I'll be great.

Day 2
Diary Response:
Today i feel very calm. I think its the rain.

Participant ID: 121206002

Day 1
Pre-Manipulation Diary Response:
Right now, I am thinking about food and what I am going to eat after finishing this experiment.

Post-Manipulation Diary Response:
Right now, I am sleepy and still hungry. But, I am thinking on whether or not I should take a nap or do work when I get back to my dorm.

Day 2
Diary Response:
I am currently thinking about why someone that I texted hasn't yet responded to my message. I am also thinking about food and which route I am going to take to get back to my dorm.

Participant ID: 131206003

Day 1
Pre-Manipulation Diary Response:
I'm kind of hungry. After speaking with the girl who set me up for the study, I'm really interested in taking psych 326 and possibly becoming apart of Lori's team.

Post-Manipulation Diary Response:

I really hope my participation in this study is helpful.

Day 2
Diary Response:
My stomach is growling. I do not know what I am going to eat. I have a class that starts within the next 30 minutes.

Participant ID: 110115004

Day 1
Pre-Manipulation Diary Response:
I am thinking about the game I just played and how I really wanted to beat my friend in "Ruzzle," I phone app. but the timer went off so Im not sure if the time is still ticking down. Also I am thinking about my trip abroad to cape town south africa. I am really nervous to leave home, my mother, for five months but I know i will learn a lot and enjoy my time there, and all will be fine.

Post-Manipulation Diary Response:
I am not feeling bad at all. I am a psych major so I am sure the act that just happened with the lady coming in, the door cracked, and her saying I wont meet the requirements of her study becuase she doesnt think ill have a high GPA does not affect me at all. Its all apart of the study.

Day 2
Diary Response:
nothing much is flowing through my mind. I am only thinking about all the errands I have to run today in order to start packing for my trip to Cape Town. Other than that I am thinking about leaving Ann Arbor for five months.

Participant ID: 110116005

Day 1
Pre-Manipulation Diary Response:
feel pretty calm right now

Post-Manipulation Diary Response:
i am just a little bored and tired. I am hungry too! i feel happy because i am done with practice and I can just chill tonight

Day 2
Diary Response:
I am soo excited for mock rock practice tonight!!

Participant ID: 240213006

Day 1
Pre-Manipulation Diary Response:
My finger's circulation is almost cut off. I have a lot to do today.

Post-Manipulation Diary Response:
That was weird. But my finger's circulation is no longer being cut off.

Day 2
Diary Response:
It's early.
Should I become a member of the executive board.
I really cannot stand my next class….or teacher.
It's valentine's day.
I don't have a valentine.
But oh well.
Was the interruption from yesterday a part of this experiment.

Participant ID: 1502130007

Day 1
Pre-Manipulation Diary Response:
I'm feeling extremely tired and a little stressed. This experiment is crazy. I'm so hungry! Me want food. I hope I don't sound crazy. I am wishing I was in my bed.

Post-Manipulation Diary Response:
This has been crazy. Some girl comes in seeming frantic as hell. She seemed like a B^{++++}. ~~I hate th~~ I'm glad I have pretty good blood pressure though.

Day 2
Diary Response:
I am kind of sad today. Relationship issues. I really want to go see him and hope that everything is okay. I'm glad to be keeping busy though.

Participant ID: 370218008

Day 1
Pre-Manipulation Diary Response:
My finger feels uncomfortable (the one attached to the electrode thing). My rt. hand is sweaty. I'm kinda hot, maybe I am nervous, maybe I am stressed, yah I am stressed kind of. Just worried about hw assignments. I am also kinda hungry. Food sounds good. My finger hurts.

Post-Manipulation Diary Response:
I am feeling SAD MAD UPSET DISSAPOINTED! Just before this portion of the experiment some woman started banging on the door. She asked the research assistant if she could ask me

some brief questions for a study she was conducting since her person failed to show up for her study. My research assistant obliged and let the woman in. When the woman saw my face she shook her head and flat out said "NO b/c her research study required students to have a high G.P. A. and that I probably didn't qualify." I suppose she felt this way b/c I am black. But I have a 3.7 GPA & took offense. I yelled this to the woman but she was already gone. That woman does not have any right to run a psych experiment and I will report her to a supervisor.

Day 2
Diary Response:
(Participant was debriefed on day 1 and did not come in for day 2. Therefore, there is no diary for day 2)

Participant ID: 260220009

Day 1
Pre-Manipulation Diary Response:
My left hand is starting to feel tingly from the pressure that's on my finger and just from keeping it still for so long. I'm frustrated that my computer won't connect to any internet service that I've tried in the past 2 hours and really hope there's nothing wrong with it! I am super hungry. I can't wait to go home tomorrow but I'm anxious about all the school work that needs to be done before then and also all the work I'm gonna need to do when I get back.

Post-Manipulation Diary Response:
My arm/fingers/ls are really tingly! I'm not good at keeping my limbs still for that long at a time. I'm curious about the interruption to the experiment by this experimenter's coleague. I have a feeling it's all part of the experiment but I'm not 100% sure. That girl gave me a real weird look.

Day 2
Diary Response:
My middle finger on my left hand is very uncomfortable & numb because of this machine that I am hooked up to. I am excited to get it off.
I want to see the results of this study when it is complete.
I have to rush when I get home.
The movie we watched in the last class was very upsetting and sad. It made me feel hopeless in a way and very upset about the human race while we were watching it. I got really emotional.

Participant ID: 330225010

Day 1
Pre-Manipulation Diary Response:
If feels very weird being hooked up to all of these wires, and the thing on my hand is really uncomfortable. Also, I kept almost falling asleep during the 10 minutes where I just had to sit there.

Post-Manipulation Diary Response:

I'm confused on why some girl came to the room during the experiment. Also, I got a little scared when the experimenter left me alone in the room and the finger and arm thing started to ~~get~~ squeeze my fingers and arm.

Day 2
Diary Response:
My classes are stressing and ~~worrying~~ making me ~~worried a~~a bit worried; also, my lack of sleep is slightly adding to my stress.

Participant ID: 220225011

Day 1
Pre-Manipulation Diary Response:
I have to pee.
I like being hooked up to things just like I like getting taped for sports. Andrew is such a little stinker, but he is a pretty good coach. It's really no surprize that he caught my attention seeing as he is cocky, witty, and talented. And short. Why do they always have to not be physically perfectly beautiful.Oh that's right .Of course.That's Ilskdjfkjl It should move the world up and board meeting our the move fun?

Post-Manipulation Diary Response:
I wonder what time it is. I also want to know why the girl couldn't use me for her study. Doing the study based on demographics and not using me would be silly because everyone who knows me knows that my physical demographics don't match my social ones.

Day 2
Diary Response:
I am so tired and sleepy and I feel bad because I keep nearly dosing off. Also how bad ass is it to have the senior preoccupied with me. Asdfl;ksjdf in general is so crazy. Why do they pick me when I don't really want them and not pick me when I do? It is so nap time after this.

Participant ID: 260227013

Day 1
Pre-Manipulation Diary Response:
I'm so tired. Test in only a couple hours, Hope I'm ready. Plus, I'm starving!

Post-Manipulation Diary Response:
I'm still tired. And I can't believe and came in, and then said nevermind. SO RUDE. I heard everything she said, shaking my head!

Day 2
Diary Response:
I can't wait to go home ~~this weekend~~, for break! :P And I'm hungry!

Participant ID: ???14???

Day 1
Pre-Manipulation Diary Response:
I feel pretty calm. My experimenter is interesting and we're getting along. My day has been up & down. I really ready to go on break, but extremely nervous about my grades, and that I won't take advantage of break as study time.

Post-Manipulation Diary Response:
I don't think I have a lot of friends. And that doesn't bother me. I think I've always cared more about having a relationship (intimately) rather than friendships, and lately those relationships have been becoming more and more confusing & frustrating. I know my focus shouldn't be on that, and schools more important but I cant help but think about it, and want….MORE.

Day 2
Diary Response:
(????Missing???)

Participant: ??????

Day 1
Pre-Manipulation Diary Response:
When I was answering the previous question on the screen I was curious as to why I was being asked these questions since I already answered these questions. Then I became intrigued with whether or not my blood pressure would go up or down dependent on the presented question, despite the fact that I answered each question honestly.
Umm, whoa, shoulder, snow, air, the practice of thinking of nothing, yoga, class, improv

Post-Manipulation Diary Response:
Anxious, curious, agitated, excited, spring break, classes

Day 2
Diary Response:
Sleepy, Friday, Evening, food, snow, break, sledding

Participant ID: 160313015

Day 1
Pre-Manipulation Diary Response:
Not much is running through my mind right now. I have a lot to do today. So I am thinking about that. I'm also trying hard to inwardly plan the rest of my day so I can be as efficient as possible. I'm not thinking about much else. I was researching medication costs ~~during my~~ earlier to see if I

could afford it, so I suppose that is also on my mind now. I feel a bit stressed. But not doing much of anything for 10 minutes helped.

Post-Manipulation Diary Response:
Now I feel incredibly angry b/c of what ~~the~~ happened during the interruption. Being told I was too stupid to be a part of a study… I am very upset & I can't stop thinking about this.

Day 2
Diary Response:
(Participant was debriefed on day 1 and did not come in for day 2. Therefore, there is no diary for day 2)

Participant ID: 240313016

Day 1
Pre-Manipulation Diary Response:
I just lost $20 and have forgotten items needed for today. Money and time is a big concern right now.

Post-Manipulation Diary Response:
Wondering why the other researching interrupted, but then said "just kidding." Thinking about work and school and being tired.

Day 2
Diary Response:
Just finished a Spanish exam, thinking it went well. Extremely hungry. More homework and work.

Participant ID: 250313017

Day 1
Pre-Manipulation Diary Response:
I'm hungry. Hooked up to a lot of stuff. Thinking about what I need to get from the grocery store. Wondering how many questions will I have to answer.

Post-Manipulation Diary Response:
What was up with that ~~yell~~ lady interrupting? She seemed kind of deserpate for me to do something then when she came in she rudely said, "nevermind." Pissed me off just a little bit. Anyway, this machine is kind of tight around my middle finger. Also thinking about how much time is left.

Day 2
Diary Response:

Contemplating various tattoo ideas (mix of hearts and music notes and music clefs) which can be seen on the left side of this sheet. Excited about my trip, dreading paying all the cash for it. Extremely thirsty. Considering getting all music tattoos.

Participant ID: 150313018

Day 1

Pre-Manipulation Diary Response:

I am upset that my Ex would try to be violent with me in the 4 previous years he was never violent and now ~~he~~ since we arent together for a year he still comes to my place and tries to abuse me and make me submit to him. I am very peeved off. But I men life moves on. You cant let things like this bring you down.

Post-Manipulation Diary Response:

I think she saw I was a woman or ~~I wa~~ maybe I wasn't the right image of woman that she was looking for. Or I mean both seemed sort of peeved off at each other so maybe she didn't want to be bothered with her later

Day 2

Diary Response:

- I am content. I am relaxed. But uncomfortable due to electrode stickers on my neck.
- I am tired and restless. I have sort of lost focus and am very bored.

Participant ID: 330318019

Day 1

Pre-Manipulation Diary Response:

Sense of calmness
Thinking about what I need to do today
Private practice tv show
Sonic desk is really heard
I'm tired
I'm hungry
Graduation speaker announced
I can finish this semester

Post-Manipulation Diary Response:

My dad is visiting me this Friday
Strange occurrence
What do those squigly lines mean?

Day 2

Diary Response:

Excited that my dad is visiting
bored

Participant ID: 220318020

Day 1

Pre-Manipulation Diary Response:

I am tired. I need to take a nap. I can't wait to do more studying for my calc 2 exam. I love food. I want to talk to my mom. I am excited about hanging out with my friend later today. My weekend was awesome. I am a bit nervous about this exam coming up. I need to get started on my engr101 project very soon. I can't wait until this semester is over. I am excited about living in an apartment by myself next semester. I need to ~~keep up~~ work out more often and consistently. I wonder what classes I'll be taking next semester. My nap is going to be so awesome!

Post-Manipulation Diary Response:

I can't wait to get home and take my nap. This girl likes me ~~but~~ and I hope I don't end up leading her on for too long. I wonder what hanging out with my friend later will be like. I wonder what I'm going to have for dinner tonight. I'm glad I started studying for my calc 2 exam over spring break. I hope I do better on this exam than my last. I really enjoy listening to music. I wonder how my mom is doing (even though I talk to her everyday). Overall, I am less stressed and depressed than I usually am. I'm actually happy and my thoughts have been quite positive. The female that walked in here and interrupted the experiment annoyed me!

Day 2

Diary Response:

I'm very nervous about my calc 2 exam tomorrow. I've been studying, but I always get nervous before exams. I'm sure I'll be fine. My friend and I didn't hang out yesterday, but we will today. I am kind of excited about that. I am ready to get all of my work out of the way so that I can stop stressing about it. My Panda Express was so delicious earlier! I need to work out again. I hope my cold symptoms don't get any worse. I hate when the weather is like this. It makes me not want to do anything! I'm really happy that I have my new glasses now! I hope ~~the guy I~~ that guy isn't hurt about the fact that I don't want to "talk" to him.

Participant ID: 220318021

Day 1

Pre-Manipulation Diary Response:

-I am ready to get out of here
-I have too much homework and other things I have to do
-I'm sleepy
-I'm hungry
-Oh lord, Astrophysics exam on Friday
-Oh man, I still have to do that English paper that's do on wed. I don't even know where to start
-I have to prioritize
-I have to get groceries
-I hope this day doesn't end without me doing half of the things on my "to do list"
-Hutt! Okay, Im done venting

-Oh, huh…. Wish Biza would have liked BichincaBia Congo video—I worked hours on it
-Ok I'm done now… this thing I'm hooked up to is kinda hurting my chest ugh

Post-Manipulation Diary Response:
-Lady came "to ask if I could participate in her research project (asked the facilitator first then she (facil) introduced her. When she saw me, she changed her mind and said she didn't want to do it. That frustrated me a little- I guess, since taking the class on race and racism in America, I thought she was probably doing it because of my race.
-then I thought, is this part of the whole research project? ? Because she didn't have any materials with her to conduct her questionnaire, she was empty handed. IDK
-Anywho, Im ready to get out of here already, too much to do.

Day 2
Diary Response:
-I am so greatful to be at the Univerisity of Michigan. My dream has come true, coming back after approx. 9 years and I am so determined to finish and finish strong.
-I wish my people had the that same opportunity, or should I say, the same education to fulfill their dreams as I did/do/will.
-Realizing that life is always what we make of it, we never have to live up to the stereotypes that are placed upon us.
-Life is good, life is hard, but all in all ~~my life is~~ I decide the outcome of the life I'm living.

Participant ID: 370318022

Day 1
Pre-Manipulation Diary Response:
- My test is Thursday
- I have a meeting at 7, another one at 8
- When I am going to eat
- Should I study at the ugli instead of going home
- I have to finish my book too for that paper due Friday
- Actually I have two papers due Friday

Post-Manipulation Diary Response:
I was worried that my finger was going to fall off
I'm curious if this experiment is set up to make me irritated. I was actually looking for cameras for a second.

Day 2
Diary Response:
(Cancelled Day 2, debriefed?)

Participant ID: 250320023

Day 1

Pre-Manipulation Diary Response:
I'm tired. I wonder if I'll make 4:30 yoga. I can't decide if I should go home or if Korey should come here. It's warm here.

Post-Manipulation Diary Response:
Well that was really rude. Not to mention she was so awkward. I'll be thinking about that all day. Hm. Oh well.

Day 2
Diary Response:
I'm glad I finally figured out what I'm doing next weekend! It'll be nice to be name for 4 days. But I'm still mad at Korey for procrastinating. He always does this! I'm a little anxious about this study- I'm just excited to see if it's the same thing because, know I have it figured out! Well I'm pretty sure I do. What should I bake for tomorrow (I can never spell that word right. 2m's and 2r's?) rice crispie treats and banana choc chip muffins! Maybe I should add some chili powder to the recipe. I'll try that next time. My hand burns.

Participant ID: 250313017

Day 1
Pre-Manipulation Diary Response:
I'm hungry. Hooked up to a lot of stuff. Thinking about what I need to get from the grocery store. Wondering how many questions will I have to answer.

Post-Manipulation Diary Response:
What was up with that ~~yell~~ lady interrupting? She seemed kind of deserpate for me to do something then when she came in she rudely said, "nevermind." Pissed me off just a little bit. Anyway, this machine is kind of tight around my middle finger. Also thinking about how much time is left.

Day 2
Diary Response:
Contemplating various tattoo ideas (mix of hearts and music notes and music clefs) which can be seen on the left side of this sheet. Excited about my trip, dreading paying all the cash for it.Extremely thirsty. Considering getting all music tattoos.

Participant ID: 150320024

Day 1
Pre-Manipulation Diary Response:
I'm wondering what exactly the conclusions from the study will be used for.
Thoughts: well I am feeling very calm right now, but I am also thinking about all of the studying I need to do tonight.
Thoughts: I really need to study a lot this week. Thinking about Blood and Chocolate, a book. I read a long time ago about werewolves. Thinking about the UGLI and Easter.

Post-Manipulation Diary Response:
Thoughts: my nails- why do I bite them… my friend at the UGLI waiting for me to study… I must look fat in only this tank top….I feel very calm…. This Guy I used to like, he's not very nice… I really need to study

Day 2
Diary Response:
Thoughts: how did I do on my Spanish exam … I'm really tired/sleepy today

Participant ID: 240325025

Day 1
Pre-Manipulation Diary Response:
This is interesting, awkward
I have a lot of wires attached to me
I feel stiff, like a robot

Post-Manipulation Diary Response:
Relaxed, a little anxious, time goes by pretty slow

Day 2
Diary Response:
Relaxed, peaceful, reminiscent, I don't know why I'm thinking about Sonic the Hedghog and jellybelly candy in a carnival packaged manner at some amusement park. I feel very random but relaxed and joyous. Ready to get some things accomplished when I leave here.

Participant ID: 240325026

Day 1
Pre-Manipulation Diary Response:
- I have homework due in 2 days
- Oh god linear algebra exam in 1 week, kinda nervous
- I miss my mother, brother & sister
- I want to sleep
- That paper is due soon

Post-Manipulation Diary Response:
(Participant was debriefed on day 1 after the manipulation. Therefore, there is no post-manipulation diary)

Day 2
Diary Response:
(Participant was debriefed on day 1 and did not come in for day 2. Therefore, there is no diary for day 2)

Participant ID: 240325025

Day 1
Pre-Manipulation Diary Response:
Food
Bible study
This sheet of paper and its purpose
Sorority/ greek life
Plans for the weekend
The rest of my night
This guy from work
Sleep.

Post-Manipulation Diary Response:
Really?!?
This girl
Is she an actress?
Is she even a student here
Did she figure I would not meet her standards because I am black?
Does she know that she is Black?
My G.P.A. is probably higher than hers.
I have a 3.5 GPA
She's crazy
It's funny and kind of stupid.

Day 2
Diary Response:
Bible study
Class
Food
That girl from yesterday, the racist one
Church
Life
Love

Participant ID: 240327028

Day 1
Pre-Manipulation Diary Response:
I need to find an apartment!
Bio Exam, study! Read those bookers for RCHUMS
Kappas→ cute
Bowen Lian→ introduce him to my friends! He is too nice/cool not to have other friends!
Fashion show! What to wear, set Bowen's ticket

Freedom house, reserve a zipcarasap (should I even go?)
Peace corp?
Need space for Bushter Falco and MutiParu
Okay, re-do hair → finish
Should I go back to north before class? Eat? Maybe.

Post-Manipulation Diary Response:
There was a short interruption. Another researcher seemed to desperately need assistance/an extra participant for her study. I would have been happy to help. Unfortunately, when my researcher (who is very nice) was going to ask me if I would be willing to help, the woman saw me and immediately backed out of the room saying "oh never mind"
I was a bit startled.
I did not intend to eavesdrop, but the walls are thin and the door was cracked. Apparently a high G.P.A. is required for her study and upon viewing me for half a second she was sure I would not meet that requirement or the other requirement of her study. Is it the scarf?
My G.P.A. is a 3.746 … is that high enough? I feel offended.
I feel uneasy, sad, and maybe even angry toward that woman for not even attempting to shield her racial profiling. Next time, just ask me the standard questions to determine if I meet the requirements. For the sake of not contributing to prejudice and other stereotypes.
Perhaps I took it too personally, perhaps the study was only for caucasian people?
Who knows. Anyway, back to my study.

Day 2
Diary Response:
Hmm, my mind is kind of on cruise control right now. Just floating along for the ride. Still need to find an apartment. Hair! ← Do it ASAP
Outfit for fashion show… get it settled
Should I go to freedom house
Ahh! I need to study for Bio and write that RCHUMS paper and submit that MUS 110 paper topic and fundraise that $1000 for NASST! Revels, revels, revels ☺ Brandon→☺ Chang→Mc Neal ☺

Participant ID: 150327029

Day 1
Pre-Manipulation Diary Response:
Right now I'm trying to concentrate on not moving a lot. I'm really focused on my index and middle fingers on my left hand because all I want to do right now is crack my knuckles :/. Umm I don't want to breath to deeply. Partly because I can't because of this thing on me. I was way more relaxed before I had to focus on my thoughts because my phone was distracting me. I feel like a robot. That is all.

Post-Manipulation Diary Response:

Okay I don't know. I'm more comfortable now than before. Probably because some weird girl just interrupted the study. That weird situation kind of relieved my minor stress about this machine. I think we're almost done here. So I'm good.

Day 2
Diary Response:
I'm a little impatient right now. I have a lot of things to do tonight and I just don't feel like doing any of it. I'm hungry and I'm just in a bit of a bad mood.

Participant ID: 240401030

Day 1
Pre-Manipulation Diary Response:
Right now I am wondering why I was asked to write the thoughts on my mind. Now I am thinking about how that 10 min. rest period made me sleepy. I am thinking about the exam I took earlier today hoping I did well on it. Now I am thinking this is very awkward and funny. I am currently running out of thoughts I want to share. Now I want to laugh because it is funny writing this, but I will remain professional. I wonder if I can doodle on this page instead of writing words if I could I would draw some hearts and a flower. This machine is that is taking the pulse in my finger feels like it is cutting off my circulation. I am getting really sleepy just sitting here. I feel like a might just dose off. I will try to keep writing although when I am tired my writing may not be the most comprehensible. I noticed with me writing without lines I am writing up the page instead of straight across. I wonder why it is hard for me to write in a straight line. Oh my goodness I am sleepy. Now I know why sleepy the dwarf eyes were so druppey I made this up lol because the kept him up working. My hand is falling asleep. This feels weird me being hooked up to this machine.

Post-Manipulation Diary Response:
Okay just had an interesting encounter a few minutes ago. Did it bother me? Yes. Will I let it control the rest of my day? Nope. I know who I am. So I will have an excellent day! Thank you for your time!

Day 2
Diary Response:
I am glad the study is almost complete. And I am excited to get to my choir rehearsal.

Participant ID: 350401031

Day 1
Pre-Manipulation Diary Response:
Food
my mom
homework
next year's living situation
my phone charger

my messages
my career/educational path
summer plans
money
my dog
my brother

Post-Manipulation Diary Response:
Tomorrow
visiting the Dr.
signing up for another study
how much money I have in my account

Day 2
Diary Response:
What/where I'm going to get dinner
My homework due tomorrow
My hair/nails, if I have time tonight to do them
Returning my book to the library
Finding more books for class

Participant ID: 250403032

Day 1
Pre-Manipulation Diary Response:
I would like some food right now. Finances. Summer housing. Loan. Applications. Letters of Rec. Classes v. work. Tests. Taxes.Taxes.Taxes. Classes for fall. Classes for spring. Spring & summer? Find receipts. Sleep. Exams.Work. Work out. Paper. Cold weather. Fooooood! Work= food!
(Also drawings included in diary of birds, flowers, and peoples names)

Post-Manipulation Diary Response:
FOOD. Running late w/ Shee. Work. Orgoll w/ Rodrigo. Sleep. Thursday. Read Bio. Discussion. Email Larry. Break-> food. Modgreek. Break. Study. Study.Spring celebration. Hw. I am in need of music. Homeland.Yo Ba bababom. Yaba bay a babom. A little White Hen. A little hen so white with fluffy feathers searches for some quain. Kakakakakakakakanay! El chose esvida. La musica se contuegecaalma. I am in need of music that would flow. Praise ye the lord! As a father pitieth his children, so the lord pitieth them that fear him.

Day 2
Diary Response:
North Korea bullshit. Falling asleep in class. Dog needs to go to the vet.

Participant ID: 260403033

Day 1
Pre-Manipulation Diary Response:
I have the new song by beyonce stuck in my head and I am also thinking about what work has to be done tonight, how much time I need to set aside in order for me to study for both of my exams, and I'm thinking about whether or not I can make time to go to "Poox City," "Hip-Hop Dance Workshop" or the Malaysian Culture Show in the same day while studying for my exams.

Post-Manipulation Diary Response:
I am wondering if the game I ordered online will be arriving soon. I am also wondering if the girl who needed a participant is ok, and whether or not she came as part of the experiment in order to see how my body reacts to annoyances.

Day 2
Diary Response:
The song "Unpretty" by TLC lyrics are flowing through my head.

Participant ID: 170403034

Day 1
Pre-Manipulation Diary Response:
Hearing funny doorbell sound from machine
chocolate…lol
bills
school work (registration & homework)

Post-Manipulation Diary Response:
Chocolate
cake school
meetings
hot food!!

Day 2
Diary Response:
Room so cold
hungry

Participant ID: 350408035

Day 1
Pre-Manipulation Diary Response:
I am wondering if I have gotten any emails or text messages since I have been here. Also, I am very tired so I am thinking about getting into my bed after this.

Post-Manipulation Diary Response:

What my friends are doing
What I am going to eat
If Michigan will win the game tonight

Day 2
Diary Response:
Hungry
Irritated
Want to get these sticky things off of my
Ready to leave.

Participant ID: 260410036

Day 1
Pre-Manipulation Diary Response:
What classes I am going to take next semester? I think I'm going to stick to nursing. But am I interested in something else. I like helping people. Neuroscience.Internal medicine. Call mom back. Angry.Running/work out.School. Should I stay at UM? Or leave? Give up this opportunity. HFCC (might mean Henry Ford Community College)? I don't know. Full.

Post-Manipulation Diary Response:
The girl who came in the room was rude and weird. People are so weird. I got excited for at least 30 secs, but I'm not sure why. Anywho, I like the way this pen writes. I'm feeling awkward today, maybe because I didn't get pretty this morning, I'm so shallow right now. I need my nails done. I should go to the gym today but I'm so tired.

Day 2
Diary Response:
Hungry
Headache
This girl always bring up memory I wish to forget
Kids
I love babies
Probate tonight, should I stay home to write my paper
Who just texted me
Cheaters!
I hate cheaters!

Participant ID: 250410037

Day 1
Pre-Manipulation Diary Response:
Nervous about China
Miss my best friend

Recent break-up
Happy… just generally
Wishing I wasn't sick
Upset about making up stats lab
Stressed about everything I have to do today

Post-Manipulation Diary Response:
Recent break up
angry/peeved Lisa
I really want some soup…
don't know what I am wearing to the gala Sunday
How much a used motorcycle costs
Cookie
Bank account balance

Day 2
Diary Response:
Me and Angel's conservation last night
Richard's probate
Cookie
Running into cannon
Finding a dress
Getting healthy
What I'm going to eat today
Seeing all my friends later

Participant ID: 1050410038

Day 1
Pre-Manipulation Diary Response:
Completing my dress for the semester
Summer time
I have to call my mom later but I'm tired
Sleep!
Resting for few minutes
Burden off my shoulders my rough draft is done

Post-Manipulation Diary Response:
Moesha
Instagram
Hair style back in the days
I'm sleepy
I almost fell asleep
Happy
Relaxed

Girlfriends (The tv show)
My hair is weird
This is almost tranquil

Day 2
Diary Response:
Calmness
Peace
Very quiet
Needed relaxations and time of tranquility
Pizza

Participant ID: 330415039

No diaries for day 1 and day 2. Ended study and debriefed at beginning of day 1 because she was fainting.

Participant ID: 240415040

Day 1
Pre-Manipulation Diary Response:
I thank God for good sense
His mercy endureth forever
Let the redeemed of the lord say so
whom he hath redeemed from the hand of the enemy
Victory in Jesus
I love you Lord and thank you for your goodness

Post-Manipulation Diary Response:
Bless the lord oh my soul and all that is within me bless his holy name
For he has done great things—Hallelujah
He has done great things
He has done great things
Bless his holy name
Thank you lord

Day 2

Even death could not hold him captive
Even in the grave he is Lord

Participant ID: 260417041

Day 1
Pre-Manipulation Diary Response:

Wondering what I have to get done today. Making to do list. How crazy do I look with these electrodes on me? The things I do for $20. I can't wait to go outside and sit in the diag.

Post-Manipulation Diary Response:
Annoyed/angry. This girl interrupted my study first off all. Interrupts me feeling relaxed & then doesn't even do what she came to do! & on top of that she assumes I don't have a high GPA. That really just ruined my mood.

Day 2
Diary Response:
I happy its nice outside & because I got to see my 2 best friends today. Also excited for spring term, that my mom is coming tomorrow, & for the concert I'm in tomorrow. Also excited for dress rehearsal tonight. I'm just overall really happy & content today.

Participant ID: 250417042

Day 1
Pre-Manipulation Diary Response:
Sleepy
Exhausted
"Have to do homework"
"I need something to eat"
Nap time
Ready for dinner

Post-Manipulation Diary Response:
Getting sleepier by the minute
I really need a nap before tonight
Have to start that paper later

Day 2
Diary Response:
Ready for tonight
Still a little sleepy
Glad I didn't have class today
A little annoyed with the weather
Hope this doesn't take long
Slightly antsy

Participant ID: 150603043

Day 1
Pre-Manipulation Diary Response:

I really don't know what I want to do with my life. Do I want to be a social worker, museum curator, or a sexologist. Then also what in the world am I going to do with myself while I have this year off before going to grad school. I just hope I won't be poor.

Post-Manipulation Diary Response:
I don't want to type this paper that is due at 11 PM. Oh well its going to be late. Nap time after this.

Day 2
Diary Response:
I hope I get this job working for the state of Michigan so I won't have to be a poor college graduate after August (graduation date).

Because I was in the middle of this experiment, I actually thought she was very rude.

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